THE ENGINEERING AND MINING JOURNAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XXXV. NO. 26.

RICHARD P. ROTHWELL, C.E., M.E.,
ROSSITER W. RAYMOND, Ph.D.,
CHARLES KIRCHHOFF, Jr., M.E., } Editors.

NOTE.—Communications relative to the editorial management should be addressed to EDITOR, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus * ; and only for articles so signed is he responsible.

SUBSCRIPTION PRICE, including postage, for the United States and Canada, $4 per annum ; $2.25 for six months ; all other countries, including postage, $5.00 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

FILE COVERS will be sent by mail for $1.25 or delivered at office for $1 each.

Advertising Rates.—See page vii.

Mr. C. A. Green is our accredited representative for New York.

Mr. A. R. Brown, Jr., is our accredited representative for Boston and the Eastern States. Office, Room 1, Simmons Building, 40 Water street, Boston.

Mr. J. Viennot, 150 South Fourth street, Philadelphia, is our accredited representative for Philadelphia.

Mr. A. H. Taylor, 159 Lake street, Chicago, is our accredited representative for Chicago and the Northwest.

Mr. O. D. Cotton, Columbus, O., is our accredited representative for Ohio, Kentucky, and Indiana.

Mr. O. J. Frost, care Boston & Colorado Smelting Company, Argo, Colo., is our accredited representative for Denver and vicinity.

REMITTANCES should always be made by Post-Office Orders or Bank Drafts on New York, made payable to THE SCIENTIFIC PUBLISHING COMPANY.

THE SCIENTIFIC PUBLISHING CO., Publishers.

R. P. ROTHWELL, Pres. HENRY M. GEER, Sec. and General Manager.

P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

EDITORIALS : PAGE.

The Price of Seats in the New York Iron and Metal Exchange..... 375
Dr. P. de P. Ricketts..... 375
The Use of Steam for Stirring the Zinc into the Bath of Base Bullion. 375
Advice to American Pyrites Mine-Owners... 375
Railroad Construction..... 375
The Butte Town-Site Contest..... 375

CORRESPONDENCE :

The Use of Gas Furnaces in Copper Smelting..... 376
Bessemerizing Copper Mattes..... 376
Mechanical Roasters..... 377

Official Statements and Reports..... 378
The Cleveland Meeting of the American Society of Mechanical Engineers 378
Miners' Safety-Lamps..... 379
The Lake Copper Interests..... 380
The English Gunpowder Trade..... 380
New Publications..... 381
On a Newly-Discovered Variation in the Effect of Prolonged Stress on Iron..... 381
Dry and Wet Silver Assays at the English Mint..... 381
The Suez Canal Traffic..... 381
The Diamond-Fields of South Africa... 382
Recent Results of the Jameson Coking Process.. 382
The Elwell-Parker Accumulator..... 382

PAGE.

Utilizing Burning Culm-Piles..... 383
Furnace, Mill, and Factory..... 383
Mineral Patents Granted by the United States Land-Office..... 383

GENERAL MINING NEWS :

Arizona..... 383
California..... 384
Canada..... 384
Colorado..... 384
Dakota..... 384
Georgia..... 384
Mexico..... 385
Michigan..... 385
Missouri..... 385
Montana..... 385
Nevada..... 385
New Mexico..... 385
North Carolina..... 385
Utah..... 385
Wyoming..... 385

FINANCIAL :

Gold and Silver Stocks..... 386
Copper Stocks..... 388

BULLION MARKET..... 388
METALS..... 389
IRON MARKET REVIEW..... 389
COAL TRADE REVIEW..... 390
STATISTICS OF COAL PRODUCTION..... 390
Advertisers' Index xii

THE New York Iron and Metal Exchange is enjoying a little boom of its own. The speculative interest in its future has been strong enough to carry the price of seats to over four hundred dollars.

WE learn that Dr. P. DE P. RICKETTS will start for the coast about the 7th of July, with a number of the members of the fourth year class in the School of Mines. The young men will visit most of the prominent smelting and milling establishments of Colorado, to familiarize themselves, under Dr. RICKETTS's instruction, with the practical metallurgy of gold and silver. Dr. RICKETTS will also visit one or two mines and milling properties, to report upon the same.

DURING the past year, a number of American desilverizing works have introduced with much success the use of steam for stirring the zinc into the bath of base bullion. In the beginning, a little trouble was experienced from the formation of explosive mixtures of hydrogen and air, but of late that drawback has been entirely overcome. The process is one that reduces the labor in desilverizing and saves time. Sometimes, steam is also introduced into the poor lead, when it contains a little too much silver to go to the softening furnaces. The steam then apparently acts chiefly in cooling the metal slowly and bringing to the surface the last traces of the rich silver, lead, and zinc alloy.

THE English technical journals have, with a suddenness that savors of an interested inspiration, discovered that the attempts to recover sulphur in the alkali manufacture have proved a failure both in England and in Germany. They hail this as a great piece of good news for the Rio Tinto, Tharsis, and other pyrites companies whose stocks, we presume, are to be boomed on the strength of it. While it would be a matter of considerable interest to American pyrites miners to see their Spanish rivals busy filling European orders, it is well for them not to be misled by the statements now given out. The great danger which threatens their prosperity is not the recovery of sulphur from the waste, but the abandonment of the Leblanc in favor of the Solvay process.

NEARLY one half of the year has passed, and we are now in a good position to compare the record of the first six months' railroad construction with that of the corresponding period in 1882. To say the least, it is not encouraging to the many industries which indirectly and directly look to the railroads as their best customers. The *Railroad Gazette* of this city, in this week's report of new mileage, places the total thus far reported this year at 1966 miles, against 4166 miles reported at the corresponding time last year. These figures, of course, are not claimed to represent fully the work done ; but they do furnish an idea of the relative activity in railroad building, and warrant the statement roughly, that we are adding one half as much new mileage to our net-work of railroads this year as a year ago. The demand for materials for new construction is usually anticipated. The iron and steel put down into new tracks were ordered probably between six months and a year ago, so that the movements of promoters and capitalists in Wall Street and other financial centers, furnish a better indication of what is coming, and are more interesting to the iron trade than the figures indicating the business which, to a large extent, has already been attended to by mills and furnaces. In this light, the prospects are not encouraging, however fair, according to current mileage reports, the past may have been.

THE BUTTE TOWN-SITE CONTEST.

The recent decision of Judge GALBRAITH, in Montana, declaring that there is no statute of the United States authorizing the department to insert in a patent for a lode claim any exceptions as to town-site rights, nor does the law make any such exceptions, and such exceptions are therefore void, is attracting wide-spread attention. The decision was rendered in the case where the owners of the Pawnbroker lode brought suit to determine the possessory right as to surface ground. There are several similar cases pending, involving a considerable area of the town-site of Butte. The case heard and decided was the Silver Bow Milling and Mining Company *vs.* W. A. CLARK *et al.* The suit was for ejectment ; a jury was waived, and the case was tried by the court. The main facts were admitted in the pleadings, and the question of title therefore was one purely of law. The lode claim was located November, 1875, under the law of May 10th, 1872, and patent obtained January 15th, 1880. The patent contained the following provision, for the insertion of which the court says there is no law : "Excepting and excluding, however, from these presents all town property rights upon the surface, and these are hereby expressly excepted and excluded from the same, all houses, buildings, structures, lots, blocks, streets, alleys, or other municipal improvements on the surface of the above-described premises not belonging to the grantees herein, and all rights necessary or proper to the occupation, possession, and enjoyment of the same."

The town-site was patented in September, 1877, and contained a provision that no title should be thereby acquired "to any mine of gold, silver, cinnabar, or copper, or to any valid mining claim or possession held under existing laws of Congress." No adverse claim was filed against the issuing of either patent.

The points decided by the court are in brief as follows :

(1.) The Land Department has no right to insert in a patent any exception or reservation which the law does not authorize. If it is done, such exception or reservation is void and of no effect ; and this may be shown at any time, either in an action at law or in a suit in equity.

(2.) A party receiving a patent from the United States is not bound by exceptions, reservations, or conditions inserted in the patent without authority of law.

(3.) There seems to be no law authorizing the Land Department to decide a conflict between a town-site and a lode claim.

(4.) By the location of the Pawnbroker claim in 1875, the locators, according to the Act of Congress of May 10th, 1872, acquired the "exclusive right of possession and the enjoyment of all the surface ground included within the lines of their location," etc. (Sec. 2322, U. S. Revised Statutes.) This act of Congress was of itself a grant of right of possession and the right to purchase. And the "exclusive right of pos-

session" granted is utterly inconsistent with a right in another to occupy or use the surface for town-site purposes.

(5.) No authority is given by the statutes to the officers of the Land Department to insert in a patent for a lode claim any exceptions as to town-site rights, and such exceptions are void.

(6.) The provision in the Butte town-site patent was authorized by Sec. 2392 U. S. Revised Statutes, and was properly inserted in the patent.

(7.) At the date of the town-site patent, the Pawnbroker was a valid mining claim, and no title to it passed by the town-site patent.

(8.) The patent for the Pawnbroker lode claim related to the location of the claim of 1875, and confirmed the right of possession.

(9.) The plaintiff's title, under the location in 1875 and the patent in 1880, was prior and superior in law to that of defendant's.

It is understood that this decision will stop proceedings in the minor courts in all of the other cases involving the right to a large area of the thriving town-site of Butte. Attorneys in Washington practicing before the Interior Department have always fought against inserting a town-site reservation in mineral patents, claiming that the Secretary in authorizing the same is exercising arbitrary power. Many mineral claimants have positively refused to receive their patents with this reservation, and they are still "on hand."

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

The Use of Gas Furnaces in Copper Smelting.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: As bearing upon the questions raised in a series of letters to the ENGINEERING AND MINING JOURNAL, I desire to submit the following facts on the use of gas furnaces in copper smelting:

The engineers of the Mansfeld Copper-Works saw the advantages which gas furnaces have over common coal furnaces, and adapted or tried to adapt them to their purposes. As early as 1867, they removed a Siemens furnace for heating sheet-copper at one of their rolling-mills, because it did not work satisfactorily. (See *Berggeist*, 1867. No. 61, p. 268.)

In 1871, they began roasting the concentrated matte in gas furnaces previous to extracting the silver according to Ziervogel's process. These furnaces have worked very satisfactorily. All details are kept a profound secret.

In 1868, they built a reverberatory furnace, according to Siemens's system, for concentrating matte. The furnace was worked for three years until 1871, and was then finally abandoned because it required one third more fuel than ordinary furnaces, and the repairs were frequent and expensive. They used removable tuyeres, and tried quite a number of devices; but they could not get it to work as cheaply as the others, and therefore abandoned it. No patent was taken out for this combination; but the results obtained were published; hence no patent can be obtained for this combination in the United States. These notices were published in the *Berggeist*, 1868, pp. 318, 361; 1869, p. 564; 1870, p. 428. *Berg- und Hüttenmännische Zeitung*, 1869, p. 389; 1871, p. 438; 1871, p. 306. *Kerl: Grundriss der Metallhüttenkunde*, 1881, p. 180.

In his article, Mr. Johnsson mentions the shaft-furnaces of the Mansfeld works; but was apparently not aware of the application of gas furnaces at those works for the very purposes which he advocates, namely, the removal of the iron and sulphur. No doubt gas furnaces were introduced at other copper-works, especially in England, long ago; but the matter has been kept secret, and hence we have no definite knowledge of them. Possibly Siemens or his representatives might be willing to furnish further information.

A. H. W.

FREIBERG, GERMANY, June 5.

Bessemerizing Copper Mattes.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: You have, during the past few months, published a number of articles and considerable correspondence on the working of copper mattes in the Bessemer converter. In replying to these articles, I will give you some details on this process, which works successfully in the establishments of the company which I formed to carry it out.

The idea of working copper mattes in a converter is not new; furthermore, it was only too natural that it should be brought out as soon as the use of this apparatus in the metallurgy of iron had become an established fact. Several attempts were made in Europe, and notably in England, by Mr. Hollway, but not one of them led to success. It could not be otherwise. In reality, these experimenters were content to make one or two trials in a steel converter, without giving any thought to the modifications which the very nature of the metal itself demanded. They were so sure of success that they did not take the trouble to seriously study the subject beforehand.

When I was called upon to go into this matter, I also met with failure in the same way. But I was convinced that it was impossible not to reach a completely favorable result, and I undertook methodically a series of experiments and studies, to which I owe the entire success which I have attained. In order to be more at liberty to work to suit myself, I built a small experimental plant with suitable blowing-engine, and a small converter, capable of treating one hundred kilograms of matte. My tests extended over two years, during which time I constantly modified either the arrangement of the plant or the process itself, until I at last arrived at a regular and perfect production.

These explanations may suffice to show why those who have attempted to solve this important question before me were unsuccessful. The converter, as used in steel-making, was not suitable for the work, and the owners of the works to whom application was made to authorize a trial could not allow them to be carried on for a long time, to modify the plant, etc. It was necessary, in order to reach a successful issue, to go to the expense of a special trial plant. That is what I did, and it is to this that I owe my success.

The following is a brief description of the work as carried out in our establishment, where there are only two operations.

1st. Melting the ore, without any previous roasting, in any suitable furnace, preferably a shaft-furnace, with the object of producing a copper matte.

2d. Casting the matte produced into a converter of special design (the "Manhès converter"), when, under the action of high-pressure blast, it is rapidly transformed into blister copper, carrying 98 or 99 per cent.

During the work in the converter, the temperature is kept very high by the combustion of the iron, sulphur, and other elements which oxidize more rapidly than copper. These substances must be present in given quantities, easily obtained by suitable additions. The oxides formed are rapidly converted into silicates by contact with the side-walls of the converter, and with additions especially provided for. A special design of the Manhès converter protects the copper from contact with the blast as soon as it is brought to the metallic state. Without this precaution, it would set solid, and the operation would be brought to an end without being completed. The operation is very simple, but I need hardly add that success depends upon many special arrangements and methods of handling, which are the result of two years' experience. As you will note, the process is characterized by the omission of all intermediate roasting and smelting processes, by the rapidity of the work and by its economy. According to local conditions, the saving in cost, compared with the Welsh or Swansea processes, is from 50 to 75 per cent, which is the result of the following:

1st. The reduction of the cost for labor to a minimum, because the operations last only a few minutes, and large quantities of metal can be produced rapidly and with little labor.

2d. The cost for fuel is very low, because no coal is necessary, except that for melting and an insignificant quantity for heating the apparatus before starting. I assume that water-power is available. If not, the fuel necessary to run the engines must be added.

I may add that, in consequence of the high temperature and the strong oxidizing action in the converter, arsenic, antimony, etc., are almost completely eliminated, so that the metal produced is always of good quality—a fact the importance of which will be evident to those familiar with the metallurgy of copper. The apparatus are simple, cheap, occupy little space, and are easily worked when their operation is once understood.

Our works are now completely organized, and consist of three melting-furnaces, each capable of putting through from 25 to 30 tons of ore per day; two small cupolas for remelting the matte in case of need; three Manhès converters, treating a ton and a half of matte in each operation; one converter, making from 22 to 24 operations per day; and the necessary blowing-engines. An establishment of such a capacity can be built rapidly and at a comparatively low cost, now that experimental work is over.

I come now to the different objections raised against my process in some articles published in your JOURNAL.

In a communication from one of your correspondents, he seeks to cast a doubt upon the economic advantages of my process, and raises points to which a true and logical reply has been made in your JOURNAL by Mr. H. M. Howe. I will only add that there are, in carrying out the process, a number of details of great importance, which I can not refer to at present, and which are the result of several years' experience.

Mr. Paul Johnsson wants to get at the same results by replacing the converter by a reverberatory furnace, in which he melts the matte. Then he oxidizes it by means of jets of air directed upon the surface of the bath through inclined tuyeres. This idea is not new, being almost as old as metallurgy itself. But the reverberatory can not replace the converter in any case, because the same advantages can not be realized. In fact, it is first necessary to melt the matte in a reverberatory furnace, an operation which is always more costly than the simple and rapid melting in a cupola. Secondly, the great economy of the converter is the result of the utilization of the heat produced by the combustion of the sulphur, iron, and other elements more readily oxidized than copper. This saving in cost is not only not realized in the reverberatory furnace, but the use of fuel to maintain the temperature of the bath of matte constantly cooled by the blast striking it is a source of expense. Thirdly, while the operation in the converter lasts from 25 to 30 minutes, it will be much longer in the reverberatory. In fact, instead of going on simultaneously throughout the mass, the oxidation is effected only on the surface, gradually penetrating farther. From time to time, the slag must be removed, to clear the bath, resulting in a loss of time and in the formation of cinder rich in copper—a natural consequence of the method of removing it. Whatever precautions may be taken, the scorification of a large quantity of iron will rapidly wear the reverberatory furnace, causing increased expense for maintenance, and numerous interruptions in the work.

These troubles are not encountered in my process: the operation is rapid, requires only the fuel necessary to melt the matte in the cupola, and yields cinder melted at a high temperature and low in copper. The wear of the lining of the converter is small, and it can be easily repaired without interrupting the work. During two years of work, we have not missed an operation as the result of an accident of this kind.

I do not want to enter into the controversy in which Messrs. Howe, Johnsson, and Raht have been engaged. I will simply answer this: As to the question of using the converter in the metallurgy of copper, it is certain that, for more than fifteen years, a number of persons have had the idea, some of whom have made experiments, Mr. Hollway apparently having been the one who has paid most attention to it. He aimed at utilizing the heat generated to melt fresh charges of ore and to carry the concentration of the matte to a certain point. But he could not produce metallic copper. Briefly, no one has been able before myself to apply this idea and obtain practical industrial results. Like many others, I have had the idea, I have worked, studied, and have built a plant necessary to carry out needed trials; and I have established the practical working of the method. I am producing daily, by treating matte in the

converter, in the converter alone, large quantities of black copper running from 98 to 99 per cent. I hold that the true author of a process is the one who, seizing an idea, often well known, studies it, and by his labor succeeds in transforming it into a practical method, yielding good results and realizing an important economical progress.

RUE CHILDEBERT 1, LYONS, May 17, 1883. PIERRE MANHES.

Mechanical Roasters.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mr. E. Gybbon Spilsbury, in a paper on Gold Mining in South Carolina, read at the Roanoke Meeting of the American Institute of Mining Engineers, and printed in your issue of June 23d, after commenting on the virtues and defects of a mechanical roasting-furnace in operation at the reduction-works of the Haile mine, makes the following statement: "Like all mechanical roasters, however, this furnace can not be relied on for perfectly uniform results; and until this and other mechanical difficulties have been obviated, I have fallen back on the old-fashioned but always reliable 'Fortschaufelungs' furnace." He then states that labor in South Carolina is 90 cents per day, and fuel less than $1 per cord, delivered; that a double-hearth furnace, of 8 tons' daily capacity (for concentrated gold-bearing sulphurets), cost only $800 to build; finally, that the cost of oxidizing roasting does not exceed $1.10 per ton.

If Mr. Spilsbury has never succeeded in constructing a mechanical roaster which gives uniform and reliable results, and if he has been so unfortunate as never to operate with one which works satisfactorily, he should not condemn, in a general way, all mechanical roasters. Of all engineers, the members of the American Institute should be progressive and well-informed. What would become of our American mining industry if we were to follow Mr. Spilbury's advice in other departments, and return to devices of a hundred years ago?

Having had especial experience in roasting, I consider it a duty to take up this question of "mechanical roasters" for the benefit of those interested in mining, who might be easily misled by the statement of an engineer so favorably known as Mr. Spilsbury.

It is a fallacy to suppose that the reverberatory furnace can be relied upon for perfectly uniform results. The latter depend entirely upon the individual skill and the fidelity of the laborer in performing his task. With our ever-fluctuating population in mining camps, it is difficult to keep a large force of men for an indefinite period at the same work, and it requires more skill and more judgment to roast a charge successfully in a reverberatory furnace than in a well-constructed mechanical furnace. Even in old-established metallurgical works in Europe, where the son inherits the trade of the father, the results of reverberatory furnace roasting are by no means entirely uniform. At the Mansfeld Copper-Works, the residues from the Ziervogel process are returned for a second roasting if they contain above 0·023 per cent of silver. In roasting zinc-blende, for the manufacture of zinc, the roasters are fined if they leave a certain percentage of sulphur in the charge, and receive a premium if they do better than the permissible margin.

When the Manhattan mill, at Austin, Nevada, abandoned roasting in reverberatory furnaces, and adopted the Stetefeldt furnace, Mr. Allen A. Curtis, the superintendent of the company, stated to me in a letter of October 6th, 1870: "August workings, as compared with the average of 1869 (using reverberatory furnaces), show a saving in cost of reduction of $12.75 per ton of ore. The percentage of silver extracted was 4·72 per cent more than the average of the year 1869."

The first progressive step in the construction of roasting-furnaces was made by William Brückner, in the furnace which bears his name. Here the "rabbler" is discharged; but the necessity of nicely regulating the fire at different stages of the process, and the judgment required to decide when the charge is finished, remain. But the roaster who knows how to treat a charge in a reverberatory furnace will certainly do better in a Brückner, because he is rid of the heavy manual labor, and can pay more attention to his fire. That the Brückner furnace can do, and has done, as good work as the reverberatory furnace, and better, and this with greater economy, Mr. Spilsbury will not deny. I have, at this moment, no statistics at hand to prove this.

The next progressive step in roasting, on this side of the Atlantic, was made by the writer, in inventing the Stetefeldt furnace. In this furnace we not only get rid of the "rabbler," but maintain a uniform condition throughout, which, however, can vary between certain limits. Hence, the fireman is called upon to exercise but a small amount of judgment. In practice, I have never failed to take a "green" laborer of average intelligence, and teach him how to fire a Stetefeldt furnace to perfection in less time than a week. It is not possible to make the same man a perfect roaster on a reverberatory furnace in so short a time.

Most other "mechanical roasters" used in this country, which work on the continuous principle, partake of the construction of the Brückner and Stetefeldt furnaces, but present no essentially new features, even if they differ materially in outward appearance.

I will now give numerous statistics as to the working of the Stetefeldt furnace, which prove that the results, far from being unreliable and lacking uniformity, are rather remarkable for their regularity and small deviations from average figures, especially so if we consider the varying character of the ores treated. In all the following statistics, decimals are omitted for the sake of brevity, and only given in monthly averages.

Surprise Valley mill, Panamint, Cal. Chlorination-tests made from September 19th to October 23d, 1875; certified by C. Weberling, assayer and superintendent.

In 96 samples, we find that the following percentages of chlorinations occur:

85 per cent.	1 time.	92 per cent.	18 times.
87 "	1 "	93 "	24 "
89 "	1 "	94 "	26 "
90 "	3 times.	95 "	12 "
91 "	7 "	96 "	3 "

The two low samples of 85 and 87 per cent were caused by having a new laborer on the furnace, who had never fired it before, the regular fireman failing to be on shift.

Manhattan mill, Austin, Nev. Chlorination-tests made from November 1st to December 24th, 1877; certified by F. E. House, assayer.

In 198 samples, we find that the following percentages of chlorinations occur:

88 per cent.	7 times	92 per cent.	28 times.
89 "	28 "	93 "	15 "
90 "	49 "	94 "	— "
91 "	68 "	95 "	3 "

The same mill. Monthly averages of chlorination-tests from October 1st, 1874, to September 30, 1875; obtained from Alexander Trippel.

1874. Oct.	90·3 per cent.	1875. April	90·8 per cent.
Nov.	89·2 "	May	91·6 "
Dec.	91·1 "	June	92·8 "
1875. Jan.	89·8 "	July	92·3 "
Feb.	90·0 "	Aug.	91·8 "
March.	90·6 "	Sept.	91·5 "

Ontario mill, Park City, Utah Ter. Chlorination-tests during July, 1881; copied from the assay-book; Joseph E. Galigh r, superintendent of the mill; C. W. Watkis, assayer.

In 58 samples, we find the following percentages of chlorinations to occur:

88 per cent.	1 time.	92 per cent.	13 times.
89 "	1 "	93 "	21 "
90 "	2 times.	94 "	9 "
90 "	8 "	95 "	3 "

The same mill. Average chlorination-tests from March to September, 1882, according to Russell's method; furnished by E. H. Russell, assayer:

1882. March	92·0 per cent.	1882. July	93·0 per cent.
April	91·3 "	Aug.	92·2 "
May	92·9 "	Sept.	91·4 "
June	92·5 "		

The same mill. Chlorination-tests, according to Russell's method, from October 12th, 1882, to January 1st, 1883; furnished by E. H. Russell, assayer.

In 131 samples, we find the following percentages of chlorinations to occur:

87 per cent.	1 time.	93 per cent.	46 times.
90 "	2 times.	94 "	33 "
91 "	10 "	95 "	9 "
92 "	30 "		

Lexington mill, Butte City, Mont. Ter. A. Wartenweiler, superintendent; G. C. Carson, assayer. Official report.

The Lexington ore contains more or less native silver; hence the results of amalgamation are a better standard for the furnace work than chlorination-tests:

Month.	Furnace.	Chlorination. Per cent.	Left in tailings. Per cent.
December, 1882	No. 1.	82·9	10·0
" "	No. 2.	85·1	11·8
January, 1883	No. 1.	85·9	9·9
" "	No. 2.	85·9	10·8
February, "	No. 1.	86·9	7·4
" "	No. 2.	86·0	8·5
March, "	No. 1.	89·9	7·8
" "	No. 2.	90·1	8·9
April, "	No. 1.	92·6	6·1
" "	No. 2.	92·5	6·5
May, "	No. 1.	93·8	5·5
" "	No. 2.	94·6	5·3

Here we observe a gradual and marked improvement in results, which is, in part, due to a change in the character of the ore, and to Mr. Wartenweiler's skillful management.

At the Auburn mill, Reno, Nev., I have roasted (oxidizing) gold-bearing sulphurets from the Meadow Lake mines with perfect success. The pyrites were completely converted into red peroxide of iron, no magnetite was formed, and no iron sulphate left undecomposed, while the gold was bright (showing itself to be so by panning out a sample of roasted ore), and amalgamated without difficulty by the ordinary pan process.

A small Stetefeldt furnace was also run near Kernville, Cal., on gold-bearing pyrites exclusively, and the gold extracted by pan amalgamation to the entire satisfaction of the owners of the mill. The statistics I have not at hand.

These statements are certainly sufficient to refute Mr. Spilsbury's wholesale condemnation of "mechanical roasters."

But we have another question to discuss, namely, that of economy. Mr. Spilsbury's figure of $800 for constructing a "Fortschaufelungs" furnace with double hearth, 40 feet by 5 feet, seems to me rather low, even if he does not include the chimney. To be rightly understood: I do not doubt the correctness of his statement for a moment; but I hesitate to believe that a first-class and durable double-hearth furnace can be built at such a low figure. And even well-constructed furnaces of this kind are expensive in repairs. For this reason, the double-hearth "Fortschaufelungsofen" has been abandoned in Freiberg, and single-hearth furnaces have taken its place. But we will leave the question of repairs entirely out of consideration, and only speak about first cost of construction. A well-constructed Stetefeldt furnace, with dust-chambers and chimney, of 24 tons' daily capacity, equal to three "Fortschaufelungs" furnaces, can certainly be erected in South Carolina for $8000. We will add to this a nominal royalty of $2500, which would be accepted by the Stetefeldt Furnace Company in such a case. Total cost of furnace, $10,500, or $8100 more than three "Fortschaufelungs" furnaces of Mr. Spilsbury's design. Calculating on this amount interest and amortization at 12 per cent per annum, we have $972. Running the works with 24 tons' daily capacity only 300 days in the year, this interest will increase the expense of roasting in the Stetefeldt furnace 13⅓ cents per ton.

To roast 24 tons of gold-bearing sulphurets in a Stetefeldt furnace would require 4 cords of wood, 3 firemen (one per 8-hour shift), and 4 men for discharging (two per 12-hour shift). Hence we have cost of roasting 24 tons:

4 cords wood, at $1.	$4.00
7 laborers, at 90 cents	6.30
Screens and tools	0.75
	$11.05
Fuel and labor per ton	$0.46
Interest	0.13½
Total per ton	$0.59½

According to Mr. Spilsbury's estimate, his cost of roasting is $1.10 per

ton. Difference in favor of the Stetefeldt furnace, 50½ cents per ton, or, on a production of 7200 tons per year, a net saving of $3636. Hence the Stetefeldt furnace would pay for itself in a very short time. In this calculation, we have taken no account of difference in cost of repairs, which is largely in favor of the Stetefeldt furnace.

A Stetefeldt furnace of less capacity would not be so profitable, but would still leave a considerable margin in its favor. C. A. STETEFELDT.

24 CLIFF STREET, NEW YORK.

OFFICIAL STATEMENTS AND REPORTS.

COPPER QUEEN MINING COMPANY, BISBEE, ARIZONA.

The second published annual report of this famous mine is somewhat meager. During the year ended March 31st, 1883, 32,942 tons of ore were extracted, 14,886 tons being taken from the 1st level and the open cut, 12,809 tons from the 2d level, 5119 tons from the 300-foot level, and 127 tons from the west end workings. The second level has proved to be all that was expected of it, and Mr. B. Williams, the superintendent, estimates that he has still there reserves amounting to 20,000 tons. Developments below the 300 level have been checked by the heavy influx of water. The incline is sinking in the limestone. During the year, $25,480.46 were paid out for two large new boilers and a hoisting-engine, which will enable a depth of 1000 feet to be reached. For toll-roads, $22,832.63 were paid, and Mr. Williams estimates that, based on last year's transportation, the saving is equal to $34,000. During the year, 33,029 tons of ore, averaging 12·73 per cent of copper, were smelted with 5687 tons of coke, and the consumption of 3125 cords of wood, producing 8,409,112 pounds of black copper running 96½ per cent fine. The total cost of mining, freight, construction, refining, and administration was $761,071.13, or 9·05 cents per pound of black copper. The returns for the sale of black and ingot copper in New York were $1,363.508.72, the net value of the year's product being $1,314,973.25, leaving a profit of $553.902.12, out of which four dividends, aggregating $475,000, were paid, leaving $78,902.12 to be added to the surplus account, which, at the end of the second fiscal year, amounted to $267,028.51.

THE CLEVELAND MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

Thursday was occupied almost entirely by excursion visits to various industrial establishments in the vicinity of Cleveland, following one another in such rapid succession that the zeal of the most enthusiastic began to flag before the day's journey was ended. On a special train, provided by the Pennsylvania Railroad, the engineers were taken first to the works of the Otis Iron and Steel Company, of which Mr. S. T. Wellman is superintendent and general manager, and under whose skillful care the works have developed into the model open-hearth plant and steel plate and axle works of the country. We shall take an early opportunity to describe the works in greater detail; and must only say now that on every hand the engineers met the evidences of a progressive spirit and of long experience.

A short ride brought the party to the works of the Cleveland City Forge and Iron Company, of which Mr. L. M. Coe is vice-president and manager. In one large building, there are fourteen helve hammers in a row, each facing its re-heating furnace, and a battery of two steam-boilers. The principal work done is the forging of car and locomotive driving-wheel axles and shafts, the largest forging of the kind which the works are capable of handling being 26 inches in diameter. A special department of the works is an annex in which coupling-pins and links are made by machinery.

Adjoining these works are the shops of the Cummer Engine Company, of which Mr. F. D. Cummer is vice-president, and William M. Barr is engineer and superintendent. The works are well stocked with modern machine tools, and we understood that special machinery was building to turn out the Cummer engine, the specialty of the works. The engineers carefully examined the work on hand, and the general verdict was a very complimentary one to the company as to carefulness and accuracy of workmanship. The machinery of the shop is driven by a Cummer engine, built at Detroit, and ample opportunity was given to note how closely the automatic cut-off adapted itself to variations. We shall, at an early date, refer more in detail to the latest design of the engine which the company has just begun to build.

The next place visited was the establishment of the Union Screw Company, one of the wonders of which Cleveland is particularly proud. In a building of noble dimensions, are hundreds of machines which automatically first cut wire into lengths and forge a head, then shape and slit it, and finally cut the thread, simultaneously putting a taper into the screw. During the entire process of manufacture, the metal is not touched by hand, the only labor, that of girls entirely, being to keep the machines supplied with raw material, and remove the finished product.

Again entering the train, the party was taken to the large works of the Brush Electric Company, splendidly equipped to manufacture the dynamo-electric machines and the lamps now known in almost every city of the country, which are the invention of Charles Brush, the electrician. Unfortunately, the time at the disposal of the visitors was limited, and the hour being noon, the machinery was not in motion.

At the works of Messrs. Warner & Swasey, was shown the running gear of the dome of the McCormick Observatory for the University of Virginia, the great object being to diminish the friction. With a load of ten tons, the weight of the dome, a force of 30 pounds, applied at the circumference, is sufficient to keep in motion at the desired speed. The dome is 35 feet in diameter, the weight being carried by a circular plate resting on nineteen central wheels, while two outer wheels for each of the latter roll on a flat circular track. Another object of interest at the works of Messrs. Warner & Swasey was a horizontal straight-line engine, designed by Prof. John E. Sweet, of Syracuse, N. Y.

At the Cleveland Malleable Iron-Works, to which the party next went, some time was spent in examining the methods of making malleable iron. The pig is partially refined to white iron in reverberatories, having a roof removable in sections. There were at the works two long rows of annealing furnaces, and the usual accessories of such a plant. We may here add that a firm at Newark, Ohio, has succeeded in constructing a furnace in which the castings are packed in bulk, the expense of the iron boxes, which wear rapidly, being thus avoided.

The enormous establishment of the Cleveland Rolling-Mill Company was then hurriedly walked through, the departments visited being the sheet mill, open-hearth plant, Bessemer steel mill, wire mill, and merchant mill.

We are indebted to Mr. William Chisolm, President, for the following notes on these works: There are four furnaces, 65 feet high and with 16-foot bosh, having each a capacity of 400 tons per day. They use Connellsville coke and Brier Hill, O., coal and Lake Superior ores from the mines of the company, blast being furnished by nine blowing-engines. The puddling-mill has 24 single furnaces with a daily capacity of 50 tons. In the merchant mill, there are four trains with a capacity of 200 tons per day, and in the sheet and plate mill five trains with a capacity of 75 tons per day. In the wire-rod mill, there are three trains capable of working 150 tons per day. One of these trains, which attracted very much attention, being considered one of the best of its kind in the country, can roll 100 tons of No. 5 rods per day of twenty-four hours, and has rolled rods from a four-inch billet 3000 feet long. The open-hearth plant consists of five furnaces, of which three are ten-ton and two twenty-ton furnaces. The best week's record of the open-hearth plant has been 1000 tons. The ingots are cogged in a two-high reversing blooming train, designed and built by the Cleveland Rolling-Mill Company. It has 38-inch rolls, the usual speed being 40 revolutions. The engines have 40-inch cylinders and a 4-foot stroke. The daily capacity of the train is 750 tons, and it can roll 7-inch square ingots down to 1½-inch square billets. The latter are principally used for wire. The Bessemer plant consists of two converters with an annual capacity of 150,000 tons of ingots, the best record of the rail mill, which the visitors did not see, being 1752 tons of rails of 60 pounds per yard section. The works employ 5800 men, have a monthly pay-roll of $250,000, and use daily 1500 tons of coal. The other part of the works shown had comparatively little that was novel or interesting, most of the machinery and furnaces being of an ancient type.

After discussing a lunch at Dean's Hall, near the works, the party took a train, and was carried off to the Central Works, at which the new blast-furnace, No. 5, of the Cleveland Rolling-Mill, was inspected. We are indebted to the kindness of Mr. Hugh Watson, superintendent, for the following details:

Furnace No. 5 has a total hight of 75 feet, and a 20-foot bosh. Blast, heated to an average of 1200 degrees Fahrenheit, in three Whitwell hot-blast stoves, 68 feet high and 21 feet in diameter, is blown through 8 tuyeres at the rate of about 30,000 cubic feet per minute at a pressure of 8 pounds. The two blowing-engines built by the Cuyahoga Steam Furnace Company, of Cleveland, are vertical, with a 38-inch steam-cylinder, an 84-inch blowing-cylinder, and 4½-foot stroke. They are reported to be doing their work very well, and were much admired by the visitors. Steam is provided by 16 boilers, 46 inches in diameter, 34 feet long, and with two flues, 16 inches in diameter. The hoist was built by Crane Brothers, of Chicago, and has a 14 by 18 inch steam cylinder, link motion, and a 5-foot drum. The ores used at this furnace are exclusively from Lake Superior, the mixture being 12½ per cent of magnetic, 12½ per cent of specular, and 75 per cent of hematite, the fuel being Connellsville coke. The average charge is 6600 pounds of fuel, 9900 pounds of ore, running 58 per cent of iron, and 3660 pounds of limestone. The average product of the furnace is 1400 tons weekly of No. 1 and No. 2 Foundry, the best record made since the furnace was blown out in February of the present year being as follows: Best day, 251 tons (at 2268 pounds) and 2052 pounds; best week, 1526 tons; and best month, 6206 tons. The furnace is admirably located for the receipt of raw materials and the shipment of product, and all its appointments are first-class.

The engineers, who had by this time a tired look, were carried off by their hosts to the city water-works. The capacity of the pumping-engines in twenty-four hours is as follows:

1 pair	Cornish pumping-engines	8,000,000 gallons.
1 "	Worthington compound duplex engines	10,000,000 "
1 "	Henderson " " "	10 000.000 "
1 "	Worthington " " "	10,000,000 "

A new storage reservoir is building in the eastern part of the city, which will have a capacity of 70,000,000 gallons. The lake tunnel through which the supply of water is drawn is 5 feet in diameter, 1¾ miles long, of which 1¼ miles are under the lake.

In going to the water-works, the party passed along the famous ore-docks of Cleveland, on which thousands and thousands of tons of ore were piled awaiting purchasers—a suggestive proof of the stagnation in the iron trade. During 1882, the receipts of iron ore at Cleveland were 1,686,000 tons, which thus far have been handled in a very crude way. Efforts are vigorously making to improve it, and among the most prominent of recent devices is that of Mr. Alexander E. Brown, which is capable of covering a very large field of utility elsewhere, in our immense docks and yards. The Brown hoisting apparatus was shown in operation; but as we propose to give it fuller attention in the near future, we need not refer to it at length here.

The tired and dusty party again got into the train and was carried back to Cleveland, with time enough on their hands to prepare for

THE FINAL SESSION,

which was held in the evening at the rooms of the Vocal Society. The first paper read was by Oberlin Smith, of Bridgeton, N. J., on Spiral Springs. After a general summary as to the value and characteristics of the various classes of springs, Mr. Smith gave the results of a series of over 200 experiments on various materials, including hard brass, soft and tempered steel, iron, phosphor-bronze, etc. The discussion which followed indicated that a number of gentlemen were inclined, from experience, to challenge some of Mr. Smith's conclusions, while others spoke in reference to the formulæ existing as to the capacity of springs.

Gustavus C. Henning, of Pittsburg, then, in a paper entitled Some Notes on Steel, gave some very interesting facts developed in testing the

steel eye-bars and girders made at the Keystone Bridge-Works, detailing the different methods of manufacturing eye-bars, and submitting data in reference to punching and drilling steel plates. Mr. Henning showed a tracing of a steel plate which had suffered accidental injury. In the efforts made to restore it to its original shape, instructive lines of weakness were developed. Mr. Henning is an enthusiast on the subject of steel for structural purposes, and states that steel is 10 per cent cheaper than iron when proportions are based upon equal strength of the structure made of both materials.

Mr. W. F. Durfee then read a paper on Machinery for Maneuvering Clutch Couplings, to which we shall refer at an early date at length. The following papers were then read by title: Economy in Subdivision, in Installation and Operation of Machinery at Varying Demand, by J. L. Horning, of Jersey City; Ingot Cranes, by Gram Curtis, of New York; On a New Method of Constructing a Crank-Shaft, by J. E. Sweet, of Syracuse, N. Y.; Note on the Water-Hammer in Steam-Pipes, by R. H. Thurston, of Hoboken, N. J.; A New Form of Balance Dynamometer, by S. S. Webber, of Lawrence, Mass.; Some of the Mechanism Employed in Multiplex Telegraphy, by T. W. Rae, of New York; On a New Method of Casting Flange Pipe, by J. E. Sweet, of Syracuse; and Note on the Effect of Prolonged Stress on Iron, by Robert H. Thurston.

After passing a series of resolutions of thanks to those to whom the society was indebted for courtesies extended, the meeting adjourned.

MINERS' SAFETY-LAMPS.*

By J. B. Marsaut.

In an elaborate essay by the engineer-in-chief of the Bessèges collieries, Gard, in the south of France, this important subject is investigated with characteristic care, thoroughness, and discriminating fairness. Belgium having in 1864 decreed the use of a standard pattern of the Mueseler safety-lamp for her deep and fiery coal-pits, the same lamp has come into extensive use in France also, after having there undergone a series of experiments at the hands of Messrs. Mallard and Le Chatelier, on behalf of the French Fire-Damp Commission. The Belgian Mueseler, which has the usual internal funnel or taper chimney of solid sheet-metal, supported above the wick by a horizontal annular diaphragm of wire-gauze, is subject to the serious inconvenience of going out when tilted; its usefulness is thereby greatly curtailed, particularly where there is any haulage on inclined planes. Ten years ago, Mr. Marsaut's own experiments led him to modify the Mueseler lamp, by discarding the diaphragm while retaining the chimney; a sheet-iron casing was also added outside the gauze cylinder, to prevent flame from passing outward through it when exposed to a current of fire-damp; and a movable ring was fitted around the circle of the air-inlets, for closing them all simultaneously, so as to extinguish the lamp. This lamp does not go out when tilted; does go out in fire-damp; and does not let flame pass outward, even when exposed to strong currents of fire-damp in any direction. The only inconvenience noted by the French Fire-Damp Commission, when recording† their high commendation of the lamp, was, that the sheet-iron casing prevents its being seen at a glance whether the lamp is all in proper order inside it.

Renewing his efforts at improvement, the author lately entered upon a further extensive series of experiments at Bessèges, of which a detailed account is given. Excellent drawings are furnished of the numerous safety-lamps tried, of which the following is a bare enumeration, all being examined and commented upon in detail as to their respective merits and demerits: the Mueseler, of Belgian and of English pattern, with several other varieties; the original Marsaut lamp of 1871, and several varieties of its present improved construction; the Davy, of Newcastle, Gard, and Dubrulle patterns, the fire-trier's, and the "tin-can;" the Stephenson, Williamson, Clanny, Bainbridge, Evan Thomas, Upton & Roberts, Birckel, Boty, Westphalian under two forms, Rosenkrantz, Combes, and Cosset-Dubrulle. Tabulated statements are given of the results obtained in the author's trials of the various lamps; in his specially elaborate trials of the Mueseler and Marsaut lamps; in his experiments upon the resistance of wire-gauze to the passage of flame, and upon the influence of the dimensions and shape of the gauze itself; and in trials of the comparative lighting powers of the different lamps.

The practical conclusions derived from these experiments are summarized as follows. With the large Davy lamp used in the Gard District, and with other lamps of the same kind, an explosive still atmosphere outside is fired by an explosion inside the lamp. The addition of a second gauze cylinder to these lamps diminishes considerably the frequency of outside explosions, but is powerless to prevent them. The flame seems to pass out through the cap of the gauze cylinder, rather than elsewhere; whence it is well to add another layer or two of gauze at this weak part. The outside atmosphere is more readily fired by explosion within a lamp in which the wick is burning low; the prevalent practice of lowering the wick on encountering fire-damp is consequently objectionable; it is better to remove the lamp slowly, keeping the wick at its usual hight. Large lamps are more dangerous than small ones, because the volume of explosive mixture they contain increases as the cube of their size, while the area of gauze or of outlet for the flame to pass through increases as the square only. The glass cylinder in the Mueseler and other lamps, though giving a better light, renders the explosions inside more violent, because the explosive mixture is thereby more confined, so that the lamp becomes a sort of miniature cannon; the glass should therefore be kept as small as possible, particularly in hight. The Belgian Mueseler, considered the safest lamp in use hitherto, sometimes explodes a still atmosphere of fire-damp outside it. Lamps with glasses are dangerous when the wick burns low, for the same reason as the Davy; in the Mueseler particularly, the flame can then more readily pass up through the chimney, and so get to the upper side of the gauze diaphragm. The plan long in vogue at Bessèges, of ascertaining the presence of fire-damp by measuring the elongation of the lamp's full flame, is safer than reducing the flame to the utmost for the purpose of seeing the blue cap of gas better; the elongation of the flame is almost always a sufficient indication. When a glass lamp is lifted up into an explosive atmosphere, it should be held there steadily till it goes out, especially in the case of lamps having their air-inlet at top: instead of being immediately withdrawn again, as would intuitively be done either through fear or to keep it alight; for a downward movement seems to have the effect of churning the gas inside the gauze, and so rendering its explosion more violent and thereby more dangerous. As soon as ever the gas burns very visibly in a lamp, and shows its characteristic tuft of flame, there is no fear of internal explosion occurring. It is particularly dangerous for a lamp to get suddenly filled with explosive mixture by a current blowing the flame against one side, or for the lamp itself to be tilted in such an atmosphere: any arrangement for checking undue access of gas to the lamp is a safeguard. The whole of the air-inlets should be protected by a least a double layer of wire-gauze, even in the Mueseler lamp with its chimney, which latter does not always isolate the flame; then, if the inner gauze ever gets red-hot, the outer still serves as a protection. The confined space inside a lamp should be kept as small as possible; but the gauze, which cools down the gases passing out through it when the lamp explodes inside, should present as large an extent of surface as can be; hence lamps are not to be relied on which have a tall glass surmounted by a dwarf gauze, such as the big Cosset-Dubrulle, the Bainbridge, and others like them. Lamps should be made of as small diameter as possible, and should carry as large a flame as they can without getting too hot; the aim should be to make a lamp behave as much as possible like a mere chimney. In glass lamps with air-inlet at top, the wick-holder should be tall enough to raise the flame as high as can be inside the glass; a neutral space is thus left in the bottom of the lamp, whereby the force of an explosion within the lamp is mitigated. A chimney in a lamp is attended with more or less risk. The slightest modification in form or arrangement of a lamp may make a considerable difference in its safety.

Marsaut Safety-Lamp.—In its present improved form, this lamp has a strong glass cylinder, 2·44 inches high, 1·65 inches inside diameter, and 0·31 inch thick, secured in a protecting cage on the top of the oil reservoir, as in the Mueseler lamp; but the Mueseler chimney, and the gauze diaphragm that carries it, are done away with. Surmounting the glass cylinder, and flush with its inside circumference, is an inner gauze cylinder, 4 inches high, tapering slightly smaller upward, and closed at the top by a gauze diaphragm. An outer gauze cylinder, about ¼ inch larger in diameter, ⅝ inch taller, and similarly closed at top, incases the inner gauze; and is fixed at the bottom into the copper ring that forms the upper rim of the cage holding the glass. The mesh of the gauze is nine hundred and thirty holes per square inch, or thirty and a half per lineal inch. The entire gauze is shielded by an external sheet-iron casing, which can be lifted off at pleasure, having inlet holes around the bottom for the air to enter the lamp, and outlet apertures at the top.

While the general shape and construction of the Mueseler lamp, as sanctioned by practice, are thus preserved in the Marsaut, the small horizontal annular diaphragm of gauze supporting the chimney in the former is replaced in the latter by the inner gauze cylinder, which presents a far larger cooling surface for the hot gases inside the lamp to pass out through. Additional safety can be secured by further covering the flat top of the inner gauze cylinder with a gauze hood, so as to double the thickness of gauze at that part, upon which the force of an explosion inside the lamp comes most directly. A third complete cylinder of gauze may even be added, if desired as an extra precaution; but two are considered safe enough by the author, and preferable generally.

The advantages of the Marsaut lamp are, that it seldom goes out when tilted, and not at all in an upward current of air, nor does it explode externally a strong current of gas blowing upon it in any direction whatever. It does not fire an explosive still mixture of air and lighting-gas, as has been proved by upward of twelve thousand trials at Bessèges, when most of the other lamps in use did so, the Belgian Mueseler included. The outside casing effectually protects the gauze from getting injured, clogged with dust, or splashed; and whenever the lamp explodes inside, the casing retards the escape of the burnt gases, which thus help to put the lamp out. By simply covering with the hand the inlet or outlet holes in the casing, the lamp can readily be put out whenever desired.

In the trials made of the Marsaut lamp at Bessèges, an explosive mixture was employed of air and of lighting-gas, which latter fires more readily than fire-damp; and the wick being reduced below its usual flame, the conditions were thus more trying than are met with underground. With three forms of the Marsaut lamp, testing two lamps of each form, upward of six thousand trials failed to produce a single external explosion; whereas fifteen Belgian Mueselers, tested simultaneously, each of them about a hundred times over, let the flame pass through the horizontal gauze diaphragm in 31 per cent of the trials, and in 2½ per cent produced explosion outside the lamp.

Still severer trials were also made, by mixing air with lighting-gas in their most highly explosive proportions, namely, 100 volumes of air to 20 volumes of gas, and exploding the still mixture inside the lamps by an electric spark. Under this excessive test, the large Davy lamp used in the Gard District exploded the mixture outside it every time; the Boty, Clanny, and Belgian Mueseler, and the Marsaut lamp with two gauze cylinders, almost every time; but twelve trials of the Marsaut with three gauzes, and ten of the fire-trier's Davy, gave not a single explosion outside. These tests, and the one preceding, point unmistakably to the desirability of reducing to the utmost both the total internal volume of a safety-lamp, and also the hight of the glass, since the blind space inclosed by the glass acts like a cannon in propelling the inside explosion violently against the gauze, and so driving the flame out through it. How great an effect has the hight of the wick in the glass was proved by these experiments, a variation of less than 0·4 in the Boty lamp being sufficient to produce or prevent explosion outside. The trials also show that the Davy of small diameter, still used in England by the fire-trier, but abandoned in the Anzin and Bessèges collieries, presents important advantages, and, if sufficiently protected against strong currents, would possess a high degree of safety. They further demonstrate that the electric spark is essentially dangerous in fiery mines; which should be borne in mind in any attempts to introduce electric lighting in colliery workings.

Investigating experimentally the mesh and shape of the wire-gauze cylinder, the author concludes that, for the same total area of apertures

* Translated and abstracted by Alfred Bache, B.A., Assoc. Inst. C.E. Published in Selected Papers of the British Institution of Civil Engineers.

† Commission du Grisou, Paris, Minutes of Meeting of March 8th, 1882.

per square inch, gauze of finer mesh is safer than a coarser and heavier make. The lamp should be made inside as nearly cylindrical as possible throughout its entire hight; and in particular the bottom of the gauze should be flush with the inner circumference of the glass. Any narrowing at this part, by the insertion of a horizontal annular diaphragm projecting inward, or by contracting the gauze cylinder to a smaller diameter than the glass, is objectionable; doubtless because the explosive mixture inside the lamp gets thereby so churned up as to augment enormously the rapidity with which it explodes, enabling the flame consequently to pass out through the gauze.

The comparative lighting power of the various lamps tried by the author was found to be as follows:

ENGLISH* STANDARD CANDLE, 100.

1. Westphalian	77	8. Mueseler, Belgian	49
2. Boty	72	9. " English	44
3. Westphalian	70	10. Bainbridge	39
4. Marsaut	69	11. Davy, Dubrulle	32
5. Williamson	56	12. " Gard	22
6. Thomas	53	13. " Newcastle	20
7. Clanny	52	14. Stephenson	17

In the Westphalian lamps, Nos. 1 and 3, the air inlet is through a collar of perforated sheet-iron all around the neck, below the bottom of the glass; No. 3 was protected by the addition of a layer of wire-gauze inside the perforated collar; but No. 1 was without this protection.

The lighting power seems to depend partly upon the metal of which the lamps are made, a brass lamp being found to give only 70 per cent of the light obtained from the same make in wrought-iron. The difference is no doubt connected with heat-conducting capacity. English lamps are generally made of brass, and German of wrought-iron. Mr. Marsaut is inclined to think steel, or perhaps malleable cast iron, would be advantageous.

THE LAKE COPPER INTERESTS.

Special Correspondence of the Engineering and Mining Journal.

The announcement that the Osceola would divide but fifty cents per share among the stockholders on the 2d proximo, instead of its usual dividend of one dollar, is another unmistakable evidence that American copper has entered on at least a transient career of hard times. This mine has never made any bluster or pretension, has avoided every thing that looked like fiction or puff-paste, and as a result it has been regarded for years as among the most trustworthy properties of all our Michigan mines. No mine now furnishes a better thermometer for judging the real condition of the market; for it illustrates what returns a mine can make, even though the percentage of copper be very very small, when the property is managed by brains. Several circumstances make the Osceola the representative mine: first, its yield per cent is as low as or lower than the average lodes; second, while the Quincy has been the foot-ball of speculation, the Pewabic alternately tossed by the bulls and hugged by the bears, according as that far-famed mirage of striking the Quincy bonanza has appeared and vanished; while the Franklin has suffered from domestic broils, and the Central has been out of the market, and the Allouez just getting out of the woods, and the Atlantic ebbing in dry days and flowing as it came time for the division of profits, and the Calumet & Hecla, with its wondrous resources, has remained oblivious to all kinds of markets; the Osceola has gone on the intelligent, economical, and unpretending tenor of its way, neither going higher nor lower unless the market for ingot has shown the most unmistakable reasons for such a procedure. To see the dividends of this mine shrink fifty per cent, therefore, makes the speculator in copper securities pause and recast the forces which now control the market.

The question of supply was considered in my letter of the 2d instant, when your correspondent attempted to give the mines the benefit of the doubt in every case of uncertainty. The reports which are now coming up from the West, and the preparations now going on at the Calumet & Hecla stamps to increase its monthly product by nearly one quarter, are *prima-facie* evidence that my estimates were too low by many million pounds. However, they were large enough for all practical purposes, since they showed, what the grim logic of events is daily proving, that American copper has turned a new and dubious leaf in its history. Your correspondent thought to take up the foreign demand and the South American and Spanish resources for its cheap supply; but the recent sale of the large block of ingot to home consumers (reaching 26,000,000 pounds, the Hancock *Mining Journal* asserts, it says, on the highest authority, instead of 20,000,000 pounds, as given by the ENGINEERING AND MINING JOURNAL), at fifteen cents, with the agreement to maintain home prices until September at sixteen cents, gives us breathing space to turn our attention to a more important field, namely, *cost of production*. Here, of course, lies the rub. The shrewdest superintendents in Copperdom have told me that they have scrutinized over and over again their schedule of expenditures; pored over every item, re-examined every detail, in hopes of finding relief from the pressure of the year's markets. What they will accomplish, like Matthew Arnold's wave of fate, only events can tell us in their hour. The Phœnix closed down, or what amounts to the same thing, last week. This mine, like the Cliff, which also lately suspended operations, was a veteran, and has been famous for its huge masses of copper. Workmen are now engaged on a mass of considerable size, and the general underground appearance of the mine is by no means discouraging, only as present prices for mineral make operations burdensome.

The cost of copper mining depends principally upon—

I. Cost of labor.
II. Cost of supplies.
III. Cost of construction.
IV. Amount of barren ground encountered.

This last factor is always more or less uncertain, excepting, strangely enough, the two mines yielding one the largest and the other the smallest percentage of mineral of all our lodes, the Calumet & Hecla and the Atlantic. Neither of these mines is compelled to "open ahead," although the former has placed eight years' steady working behind its present active workings. The Atlantic does not "open ahead," in fact, could not do so through any barren ground at all and find its returns equal to its expenses. Its percentage of mineral is small, but its yield is regular and to be depended upon. It therefore sinks no winzes, but carries its stopes along with even pace with its sinking and drifting, thus moving its stopes more or less automatically. If this much-praised (and justly praised) property was compelled to go through such long and discouraging stretches of lean rock as the Pewabic, for instance, or the splendid Osceola, the Atlantic stockholders would sit by the rivers of Babylon and try to sing their songs of dividends in vain. The Atlantic, however, encounters no barren ground, but sends every thing through the stamps. The Franklin shows a decided tendency upward in its copper-bearing rock. The same is true of the Allouez, and, at present reports, of the Copper Falls, Peninsula, and, perhaps, the Pewabic. A comparison of the amount of discarded to hoisted rock, in an exhibit taken from the Osceola records, shows that the unproductive ground has been steadily gaining since 1879 at that property, although this is in a great measure due to exploring and other extraneous work. If, as I myself think, the year's work for 1883 should show as high an average yield of mineral per ton of rock hoisted and sent through the mill as was shown in 1880, the cost of producing a pound of copper would be reduced over one cent from present prices. If it reaches the yield both of productive ground and percentage of mineral given in 1879 (of which I do not pretend to be certain), the cost of production will be reduced nearly two cents per pound in this one direction alone. Of course, we can not see into the rock; but from what data there are at hand, it is quite certain that retrenchment will automatically set in along this line, not only in the Osceola, but also in many other of our lake mines.

III. *Construction Account.*—Construction, as a rule, will be particularly light this year. Outside of the railroad at the Conglomerate, the new locomotive at the Allouez, the new mills at the National, Conglomerate, and Peninsula, two heads at the Copper Falls, some improvements at the British and other mines in Ontonagon, and the usual tremendous outlay at the Calumet & Hecla, the aggregate construction account of Copperdom will not cut any remarkable figure in the year's expenditures In times past, the introduction of improved hoisting-engines, air-compressors, power-drills, ball-heads in the mills, and improved facilities for treating large boulders at the rock-houses, has combined to swell the construction account into a very formidable proportion of the annual outlay. In some cases, it has reached nearly if not quite one fourth of the combined mining expenses. Nearly all of our mines are now well on their feet; the era of excessive expenditures for plants and mills has happily been passed; and they are able to cope with the events of a low market this year as never before. This summary is hopeful, therefore, in this, that it indicates first a decrease in construction expenditures, while it holds out, secondly, a confident hope of very increased returns in work accomplished.

II. *Cost of Supplies.*—Where the mines use coal for fuel, the cost of supplies about equals the cost of labor. Along the whole line of outgoes for supplies, retrenchment reasonably seems to be the order of the day. The general decline in manufactured iron will reduce the cost of supplies in this direction. I do not know as the manufacturers of machinery have as yet succumbed to the logic of the times; but such a course is inevitable, and not distant; for, in case the ironmongers should maintain prices at a notch which should help drive a large number of mines to the wall, a lack of buyers would glut the market with their wares, which is always sufficient, in the absence of combination and restriction, to disorganize and lower the market. There must also be a reduction in the price of coals. From what data there are at hand, it would seem to your correspondent as if we were on the threshold of a collapse in this industry. Whatever may be the condition of the anthracite market, and that forms no part of our present study, it is quite certain that the era of cheaper bituminous coal is very near at hand. Of course, it is impossible at this distance to keep one's finger on the pulse of the Pennsylvania and Maryland fields, and no pretension is made to infallibility of opinion; but the competition among carriers of soft coal has already proved an entering-wedge, and this, coupled with the cut in canal tolls by the Chesapeake people, and the struggle for business by the Cumberland mines, must split prices into smaller fragments. Lake people have always been willing to pay round prices for food, coals, iron supplies, and all items of construction; but, gentlemen, we can do so no longer. We must have lower prices or put our necks beneath the guillotine of bankruptcy. If prices come down, our people will do their level best to keep our mines from turning beam's end until the squall be over or we have adjusted our reckonings and outridden it into new ports.

These considerations lead us to infer that there will be a general movement of retrenchment through the whole list of expenditures, greater with some mines than others, but general and pronounced among all. If it should turn out that, in several of the mines on which attention is now fixed, the rock broken should show a better general average than last year; if the "construction account," which has eaten such holes in past revenues, can now be safely and generally dispensed with; and if the price of metal and fuel supplies comes down within reason, it is altogether probable that the cost of producing copper will be materially diminished this year. This should afford a good crumb of comfort to holders of discouraging properties, even if the comfort be only a mere crumb. It remains to study the wages problem, and then draw a general summary of the outlook of our individual mines. SPECULAR.

* The *bougie de l'Etoile*, frequently taken in French for the standard of lighting power, and so adopted by the author, is a stearine candle, of five to the pound, burning 9·6 grams per hour. The English standard is a sperm candle, of six to the pound, burning 120 grains per hour: it is found to give only 90 per cent of the light from the French *bougie de l'Etoile*. Hence the author's own percentages in this comparison are 0·9 of those here given, and range from 69 per cent for No. 1 down to 15 per cent for No. 14.

THE ENGLISH GUNPOWDER TRADE.—From the tables of imports and exports of gunpowder given in the appendix to the report of the Inspectors of Explosives, it is evident that the exports from Great Britain have been slowly declining during the last twelve years, the figures showing that while in 1870 154,979 cwt., valued at £427,229, were exported, only 126,604 cwt., worth £357,802, were sent out of the country in 1882. The importation, on the other hand, has been rapidly, though somewhat irregularly, increasing—mostly from Germany. In 1870, the total quantity received was 1187 cwt. valued at £6648. In 1882, the quantity imported was 9122 cwt., worth £37,130. England imported 1,008,050 pounds of dynamite during 1882.

NEW PUBLICATIONS.

THE RAILROAD SPIRAL. By WILLIAM H. SEARLES, C.E. New York : John Wiley & Sons. 1882. 12mo, vii+85 pages.

As a sequel to his well-known work *Field Engineering*, Mr. Searles has published the *Railroad Spiral*, in which he gives the theory of the compound transition curve, reducing it to a practical and convenient form for ordinary field-work. In an appendix, tables of deflections and ordinates for five hundred spirals are added.

THE ALAMO CITY GUIDE. SAN ANTONIO, TEXAS. *Being an Historical Sketch of the Ancient City of the Alamo, and Business Review ; with Notes of Present Advantages, together with a Complete Guide to all the Prominent Points of Interest about the City, and a Compilation of Facts of Value to Visitors and Residents.* By STEPHEN GOULD. San Antonio, Texas. 8vo, 151 pages. Illustrated.

Besides such matter as is appropriate to a guide, the author has, in his twenty closely printed chapters, presented to the reader a great deal of historical and statistical information of a more permanent character and more general interest. The history of San Antonio is the history of Texas ; for in forty-six days after the massacre of the Alamo, the battle of San Jacinto was fought, the declaration of independence was passed, Santa Anna was captured, and Texas was a nation. The growth of American towns in the West and Southwest to which we have become so accustomed comes out in sharp relief on pages which confront each other in this little book, where, on the one hand, we see, in 1857, the long trains of Mexican carts and "prairie schooners" passing through the narrow streets, by the old adobe buildings ; and on the other, read that the total sales of 1881 exceeded twenty-five million dollars. We mention, besides the introductory chapter, giving the General History, the chapters on San Antonio as a Trade Center ; Railroads ; San Antonio as a Health Resort ; Water Power and Manufactures ; Building Material ; Mines in Western Texas ; and Agriculture and Fruit-Growing. Among the illustrations, is one in which the half-Moorish, half-Christian Missions near this new-old town are effectively grouped—Spain, antiquity, and ruin looking down upon a greater than Spain, young, and teeming with energy.

ON A NEWLY-DISCOVERED VARIATION IN THE EFFECT OF PROLONGED STRESS ON IRON.*

By Robert H. Thurston, Stevens Institute, Hoboken, N. J.

Early in the year 1874, the writer presented to the American Society of Civil Engineers a paper on the Strength, etc., of Materials, as Exhibited by a Testing-Machine having an Autographic Registry, in which paper some singular and important effects of prolonged and intermitted stress were described for the first time. In considering the effect of time of application of stress, it was shown that a peculiar difference of effect was observeable in metals accordingly as they belonged to the viscous or non-viscous classes, or, as the writer then stated it, to the iron or the tin class. It was shown that soft metals are subject to a flow which causes gradual yielding under their maximum loads, while common iron and steel, on the contrary, exhibit a singular elevation of the normal limit of elasticity when subjected to internal stress. It was further remarked, that the well-known experiment of Vicat,† in which he found that iron wire loaded with two thirds its breaking weight, as determined by ordinary test, gradually yielded and finally broke, after two years under stress, were indications of the probability that this process of stiffening under load may, nevertheless, be accompanied by a flaw causing ultimate fracture, if the load be heavy. No evidence of such flaw had, however, been detected by the writer in ordinary iron, although occurring almost invariably with other metals. It was finally concluded to repeat the experiment of Vicat in as nearly as possible the same way as the original tests were made.

Two samples of wires made by the Trenton Wire-Works were furnished the writer by Mr. William Hewitt, the vice-president. Both were No. 36 wire (B. W. G.), 0·004 inch (0·1016 mm.) in diameter, and of the same kind of iron. One coil was hard-drawn, directly from the rolls, and the other was very thoroughly annealed, and consequently soft. Lengths of each kind of wire were carefully tested in the usual manner, to determine their strength under ordinary conditions of test, and similar lengths were then measured off for test by prolonged stress. These latter specimens were suspended from a set of coiled springs hung from the ceiling in the study of the writer, where they would be constantly under his eye and where, also, they would be safe against accidental injury. These springs were used because it was found that the jar due to the breaking of one wire was liable to injure those hanging near it. After the wires were suspended, they were carefully loaded and were finally thoroughly painted with oil-paint and left carrying weights as below. The table gives the weights in percentage of maximum loads under test, in the testing-machine, in the usual way :

EFFECT OF PROLONGED STRESS—SWEDISH IRON WIRE.

PER CENT MAX. STATIC LOAD.	TIME UNDER STRESS.	
	Hard wire (unannealed).	Soft (annealed).
95	80 days.	3 minutes.
90	35 days.	5 minutes.
85	18 months, still unbroken.	1 day.
80	3 months.	9 months.
75		17 days.
70		15 months.
65	Unbroken.	15 months.
60		Unbroken.
55		"

These figures seem to reveal an important difference—previously undiscovered, so far as the writer is aware—between hard and annealed iron wire. Hard wire, unannealed and just as it left the draw-plate, sustained 85 per cent its original breaking load, as determined by usual tests, seventeen months ; and a wire loaded with 5 per cent less weight, three months (the difference is probably due to some concealed defect in the latter) ; while the same wire, annealed and then softened so much as to have lost about half as great a maximum load, broke under but 65 per per cent of that reduced load at the end of fifteen months. Those wires which are still unbroken will be left suspended, and, meantime, another series will be put under test. The final result will be reported to the Society in due time, should they all finally break. The broken wires exhibit no traces of corrosion or injury, and the coat of paint with which they are covered is apparently as sound as when first applied. These results evidently more than corroborate the experiments of Vicat, showing progressive disruption in both qualities of wire when heavily loaded. They also exhibit an unsuspected difference in the degree to which this occurs with hard and soft iron, showing the former to be, apparently, the safer. It is interesting to observe that the factor of safety for soft iron, under prolonged stress, must be as great as that for timber under the same conditions, both remaining uninjured by oxidation. These new facts have seemed to the writer so important that he has already announced the conclusion here given by publication in *Science*. They are presented here also as being of especial importance to the engineer.

* A paper read at the Cleveland Meeting of the American Society of Mechanical Engineers.

† *Annales de Chimie et de Physique*, 1834.

DRY AND WET SILVER ASSAYS AT THE ENGLISH MINT.

Prof. W. Chandler Roberts, in the thirteenth annual report of the Deputy Master of the British Mint, makes the following interesting statement in regard to the accuracy of the wet and dry methods of making silver assays : Since 1871, the volumetrical method devised by Gay-Lussac has been used for verifying the composition of bars and coin. It only claims to be a means of verifying the standard of an alloy, and consequently it can not be applied to alloys the composition of which is not approximately known. It is true that this objection does not apply to the ordinary practice of the mint, as "trade assay reports" are furnished either with the ingots or with so little delay that no inconvenience need ensue. The reasons which led to the adoption of the "wet" or verification method in France formed the subject of an elaborate series of papers communicated by M. Thiers to the British government in 1836. I have so frequently alluded to its advantages that it may be well to explain why the assay by cupellation was retained in reorganizing the Assay Department.

The commissioners appointed in France in 1829, to investigate the methods of assay then in use, sent alloys of silver and copper, the standards of which were accurately known, to the assayers of the principal European mints, including the mint in this country. The reports of all these assayers indicated the presence of less silver than the alloys actually contained, the deficiencies varying from 0·2 to 1·0 per cent. The evidence gathered by the commissioners led them to recommend the adoption of Gay-Lussac's method, and the authority of the commission, of which the well-known chemists Thénard, Dulong, and Gay-Lussac were members, discredited the "dry" process on the continent, and led to its being employed only for obtaining an aproximate assay. In this country, on the other hand, the method was retained, carefully devised furnaces and appliances were adopted, and the results of the assays were controlled by an elaborate system of "check assays" on standards of known composition. It is unquestionable that the process has been conducted for centuries in this country with great skill by successive assayers of the mint, and, in later years at least, has yielded results which are not merely trustworthy, but deserve the highest confidence.

I was anxious that this process, which may be considered to be historical, should be retained for its own sake, quite apart from the necessity of employing it whenever the composition of the alloy is not approximately known. The traditional skill in conducting the dry process has, I am satisfied, been well sustained, and all the ingots imported for coinage during the past year have been assayed by its means. Since the close of the year, however, 1097 verification assays of ingots have been conducted by the wet process, and in future either process will be used, as special circumstances may require.

THE SUEZ CANAL TRAFFIC.—The statement below shows that the troubles in Egypt, whatever harm they may have done in other quarters, have not resulted in loss to the Suez Canal Company. During the year 1882, 3198 vessels, of a total of 7,122,125 tons gross, passed through the canal. The total movement of navigation and receipts for each year since the opening was as follows :

Years.	Vessels.	Gross Tons.	Receipts. Francs.
1870	486	435,911	5,159,327
1871	765	761,467	8,993,732
1872	1,082	1,439,169	16,407,591
1873	1,173	2,085,072	22,897,319
1874	1,264	2,423,672	24,859,383
1875	1,494	2,940,708	28,886,302
1876	1,457	3,072,107	29,974,998
1877	1,663	3,418,949	32,774,344
1878	1,593	3,291,555	31,098,229
1879	1,477	3,236,942	29,686,060
1880	2,026	4,344,519	39,840,487
1881	2,727	5,794,401	51,274,352
1882	3,198	7,122,125	60,545,881

Compared with 1881, last year shows an increase of 17·27 per cent in the number of vessels, 22·91 per cent in the tonnage, and 18·08 per cent in the receipts. The average tonnage per ship was 2227 tons. During the year, 407 vessels passed through the canal for the first time. The 3198 vessels which made the passage consisted of 1610 from the Mediterranean to the Red Sea, and 1588 from the Red Sea to the Mediterranean. The total number was made up of 2361 trading steamers, 501 mail steamers, 134 vessels chartered by the British government, 154 government vessels, 10 yachts, one floating dock, and 37 tugs. The passengers carried consisted of 62,898 soldiers, 38,288 civilians, 6390 pilgrims, 797 convicts, and 13,499 emigrants.

THE DIAMOND-FIELDS OF SOUTH AFRICA.

At the meeting of the British Institution of Civil Engineers, the paper read was on the Diamond-Fields and Mines of South Africa, by Mr. James N. Paxman, Assoc. M. Inst. C.E.

Kimberley, the center of the most important field, is situated in Griqualand West, above 700 miles northeast from Table Bay, and 450 miles inland from Port Elizabeth and Natal on the east coast. Lines of railroad are in course of construction from Table Bay and Port Elizabeth to Kimberley, and are about half completed. In Griqualand, there are several diamond mines, the principal of which are Kimberley, De Beer's, Du Toit's Pan, and Bultfontein. In the Orange Free States, there are also two mines, namely, Jagersfontein and Koffeyfontein, the first of which produces fine white stones. The mines are all divided into claims, the greatest number of which are to be found in the Du Toit's Pan mine. Bultfontein comes next.

The deepest and most regularly worked is the Kimberley mine. The next deepest is De Beer's, which, however, is very unevenly worked. Then follow Du Toit's Pan and Bultfontein. The Du Toit's Pan mine ranks next in importance to the Kimberley mine. Diamonds were first discovered in 1867 by Mr. O'Reilly, a trader and hunter, who visited a colonist named Van Niekirk, residing in Griqua. The first diamond, on being sent to the authorities, was valued at £500. Considerable excitement was caused throughout the colony, and the natives commenced to look for diamonds, and many were found, among which was one of 83½ carats, valued at £15,000. In 1868, many enterprising colonists made their way up the Vaal River, and were successful in finding a good number of diamonds. The center of the river diggings on the Transvaal side is Klipdrift, and on the opposite side Pniel. In all there are fourteen river diggings. Du Toit's Pan and Bultfontein mines were discovered in 1870 at a distance of twenty-four miles from the river diggings. The diggers took possession of these places. Licenses were granted giving the first diggers a right to work. In 1871, De Beer's and Kimberley mines were discovered, and, in 1872, Mr. Spalding's great diamond of 282½ carats was found at the river diggings.

The mines are of irregular shape, and are surrounded by reef. The top reef is a loose shale, and has given great trouble from the frequent slips. Below this are strata of trachytic breccia and augite; the formation is then seamy to an unknown depth.

Within the reef, the surface soil is red and of a sandy nature. The next stratum is of a loose yellow gravelly lime, and the third blue, of a hard slaty nature. This last is the real diamantiferous soil. Large stones have been found in the "yellow," but the working of this generally does not pay. Kimberley mine, however, has paid very well all through. The method of working in deep ground is determined by roadways running north and south. The soil is hauled up to these roadways, and taken to the sorting-tables. The roadways decaying shortly after exposure to the atmosphere, a system of hand windlass was adopted, which worked very well for a time until horse-whims were introduced in 1873. The depth of the mines increasing, horse-whims had to give way to steam-engines in 1876.

The first diggers treated on an average ten loads per day each party. At the present time, the least taken out by an engine, when fully employed, is 250 loads per day. The cost of working, with present appliances, the first 100 feet in depth, is 3s. 6d. per load; the second 100 feet (mostly blue), 5s.; the third 100 feet, 8s.; and the fourth 100 feet, 11s. Through scarcity of water, a system of dry-sorting had to be resorted to for several years; but it was superseded by the introduction of washing machinery, which is now generally employed.

At the beginning, through inexperience, many serious mistakes were made. When the first diggers reached the bottom of the red sand, they thought no diamonds would be found in the next stratum. When, however, diamonds were found in the second stratum, the diggers had again to remove the *débris*, and so also when the "blue" was reached. Some of the claims in the Du Toit's Pan and Bultfontein mines are irregular in shape. The other mines, however, have been properly and regularly laid out. One or two shafts have been connected with the mines by underground galleries. These galleries are convenient in the case of falls of reef. Labor, at first, was cheap; but from 20s. per month, wages rose to 30s. per week, and food. The yellow soil offers no difficulty in working, being loose and broken, but the blue soil requires blasting.

Several methods were adopted for extracting the soil and carrying it from the mine before steam was introduced. The cost of wood for heating purposes was a serious item; but good coal has now been found at 160 miles from Kimberley, costing £13 per ton. Another serious item of expense is the transport over natural roads only, costing from £18 to £30 per ton.

Water is dear, and water-heaters are fitted to each engine, by which 33 per cent of the water is again used, thus saving one third. The boilers are of the locomotive type, mostly of steel, to save weight, and thus reduce the cost of transit. The fire-boxes are also made of steel of very soft and ductile quality. A semi-portable engine is made for driving the wash-mill. The engine is so arranged that it may be removed from the boiler and placed separately. The boiler is made to work at a pressure of 140 pounds per square inch. Automatic cut-off gear is fixed to each engine, and the governors are provided with a spiral spring for adjusting the speed. A screen, or cylinder wash-mill and elevator, is used for dealing with the diamantiferous soil. Standing wires are fixed at the back of the machinery, and pass over a frame fixed at the top of the mine, the ends of the wires being secured to strong wooden posts. After the blue soil has been blasted and collected into trucks, it is placed in tubs, which ascend the standing wires. It is then emptied into the depositing-box. The yellow soil may be put into the wash-mill directly, also that portion of the blue which has passed through the screen fixed over the depositing-box. The remainder of the blue, which is spread out to a thickness of four inches or six inches on the depositing ground some distance from the mine to dry, is delivered into the upper part of the screen. The return water from the elevator, with a portion of fresh water, is also discharged at this point, and operations are thus greatly facilitated, the soil becoming thoroughly saturated and passing more easily down the chutes. The large pieces which will not drop through the meshes of the screen are discharged into trucks at the lower end and carried away. The smaller pieces with water, in the form of sludge, fall through into a chute, and thence are conveyed into the wash-mill pan, and there kept in constant rotating motion by agitators. The diamonds and other pieces of high specific gravity sink to the deepest part of the pan, and the remainder of the sludge is forced over the inner ledge to the elevator. The sludge is then lifted and thrown upon an inclined screen and down the chute over the side of the bank. The residue left in the pan at the end of the day's work is passed through a pulsator, in which, by the force of water, the mud and lighter particles are carried away, leaving behind the diamonds, agates, garnets, and other heavy stones. It is the practice occasionally to put a few inferior stones in the soil, to test the efficiency of the machinery.

In 1881, the author paid a visit to Kimberley, and found the industry a large one. The post-office showed the value of diamonds passed through the office in one year to be £3,685,000. Illicit diamond traffic has hitherto been a source of great trouble at the fields. It is a question whether this industry will ever cease; in any case, there is no doubt but that it will last for over a century. It is believed that the main bed of diamonds has not yet been reached, and that the mines in operation are merely shafts leading to it. Now that the water-works are finished, with a bountiful supply of water, coupled with the great boon of railroads to the fields, and the advantage of a law recently passed for the prevention of illicit buying, a great and prosperous future is in store for the diamond-fields.

RECENT RESULTS OF THE JAMESON COKING PROCESS.

Mr. T. B. Lightfoot, C.E., in a paper read before the Society of Arts, gives the following as the results obtained with the Jameson method of utilizing the by-products in the manufacture of coke:

Kind of coal.	Gals. of crude oil.	Ammonia estimated in pounds of sulphate.
Shiremoor	13·00	9·87
Brancepeth cannel	12·20	6·00
Longhirst, small	9·28	17·78

The following may be taken as an average analysis of the crude oil:

	Per cent.
Lubricating oil	39·5
Burning oil	37·7
Paraffine scale	13·5
Tar and loss	9·3
	100·0

The composition of the gas collected from the Jameson ovens, after its passage through the condenser, varies according to the coal under treatment and the length of time the charge has been burning. An approximate average is given in the following table:

Carbonic acid	3·5
Carbonic oxide	27·5
Hydrogen	29·3
Oxygen	1·1
Nitrogen	38 6
	100·0

THE ELWELL-PARKER ACCUMULATOR.

A new accumulator has been recently brought out in England by Messrs. Elwell & Parker. The *Engineer* describes the method of making it as follows: Strips of sheet-lead nine inches wide and any convenient length, weighing two pounds to the square foot, are passed through a machine which first punches holes entirely through them and then impresses them with indentations, which act as distance-pieces to keep the layers of each plate apart. The holes secure a free circulation to the electrolyte. These strips are then rolled spirally into cylinders containing, in the small cells, three thicknesses of plate each, the joints being made secure by fusing with a soldering-iron, and an anode of much thicker lead being fused on at the same time. Each cell contains eight of these cylinders a quarter of an inch apart. The lead cylinders are first placed in a bath containing a dilute solution of nitric and sulphuric acid, and left there for twenty-four hours. The effect of this bath is to minutely honeycomb the lead plates, putting them into the most favorable condition for "formation" by the electric current. There is also formed upon the surface of the plates a deposit of sulphate of lead, the greater part of which is subsequently reduced to peroxide, part of it being first washed off. The plates, on being taken from the bath, are washed, and then placed in the ordinary dilute sulphuric acid solution in the cell. They are then charged in one direction for six hours with a current of 12 ampères, discharged in about three hours through ten Swan 45 volt, 20-candle lamps—twenty-two cells give 45 volts—and charged again in the reverse direction. They are then ready for use. There is then no sulphate visible, the peroxide plate being a rich, dark brown color, of smooth, hard crystalline appearance, and the negative plate presenting a clean surface of ordinary lead color. The cells are coupled by clamping the electrodes together. The plates or cylinders are retained in position by notched vulcanite frames underneath, and notched distance-pieces of the same material on the top, thus leaving the entire space between the plates and a space underneath them open for the free circulation of the electrolyte. The period occupied for the cutting up of the lead strips to the complete charging of the battery ready to send out is only forty-eight hours. Earthenware cells are generally used; but the company manufacturing under the patent also uses wood cells, coated inside with a composition of gutta-percha; these are preferable where strength and lightness are required. The quantity these cells will give out at an electro-motive force of two volts or rather more—same as the original Planté cell—is about forty ampère hours when sent from the works; that is, supposing an accumulator is required to give a current at an electro-motive force of 45 volts, twenty-two of these cells will give a current of 10 ampères for four hours before any of the cells "give out." But the capacity of the cell may be greatly increased by occasionally reversing the charging currents, as in the original Planté cell. The cells are packed in small cases of three cells, carpet being slipped between the plates. They seem to travel safely thus.

UTILIZING BURNING CULM-PILES.

An interesting application of a patent analogous to those for utilizing the waste products of coke, recently taken out by Mr. H. L. Armour, and the property of the Jameson Coke Company. Limited, has just been made in the case of a pit-heap at Seaton Burn Colliery, in Northumberland. A pit-heap is a deposit for quantities of small coal and dust, for which, as a rule, no market can be found, as well as for shale and iron pyrites met with in working the coal. These heaps are generally burning, and in very many instances, give off so much smoke and dirt as to become a terrible nuisance to the neighborhood. This was the case at Seaton Burn ; but by simply covering the heap with sand, and sinking a number of iron pipes connected with a main, in which a constant suction is maintained, all offense has been removed, and a stream of gas, yielding both oil and ammonia, is obtained. In this manner, a worse than valueless property has been converted into a profitable one, and, as the system is now in course of extension to large heaps at Kelvinside, near Glasgow, it is to be hoped that before long an end will be put to one of the greatest nuisances in colliery districts.

FURNACE, MILL, AND FACTORY.

The Iowa Barbed Iron-Works will be removed from Johnstown to Easton, Pa. The mills are running fourteen hours a day with heavy orders.

A large iron furnace is among the possibilities at Tyrone, Pa.

The Ohio Multiplex Boring Machine Company has been incorporated at Cleveland, Ohio, with a capital of $150,000.

The Pennsylvania & New York Railroad Company is building a new foundry at Sayre, N. Y. The main building is to be 124 by 63 feet, and over three hundred men will be employed.

The Deane Steam-Pump Company, of Holyoke, Mass., has removed its office and warerooms in Philadelphia from No. 43 South Fourth street, to No. 49 North Seventh street.

The Cummer Engine Company, of Cleveland, Ohio, will send one of its 150 horse-power automatic engines to the Louisville Exposition.

Calamining is the name of the new process for coating iron, introduced by Messrs. Everson, Macrum & Co., of the Pennsylvania Iron-Works, Pittsburg, who find it a very successful substitute for galvanizing.

The long-unused property of the New York Steam-Engine Company, at Worcester, Mass., with buildings, engines, etc., has been purchased by William Allen & Sons, of the Worcester Boiler-Works, and is to be fitted up for their occupancy.

The Keystone Iron-Works, of Reading, Pa., J. V. Craig & Son, proprietors, resumed work June 18th, after six months' idleness.

The Union Iron-Works, San Francisco, intend to erect extensive works during the summer, and will connect them with the railroad.

A firm in Lansingburg, New York, has nearly finished a "paper steamboat," for a Pittsburg company. The vessel is 20 feet long, can seat twenty-five persons, and will carry three tons. Its sheathing is a solid body of paper three-eighths of an inch thick. A bullet from a revolver, fired at the sheathing from a distance of only four feet, neither penetrated nor abraded it.

A telegram from Pittsburg to the daily newspapers says that Oliver Brothers and Phillips's lower mills, and several other mills at Pittsburg, will close July 1st for repairs. The stoppage will consume from four to six weeks, and is as welcome to the workmen as to the operators.

The Northeastern Steel-Works Company, Middlesborough, England, formed some twelve months ago, has practically begun operations, making its first experimental blow in one of its converters on Thursday, May 31st. They have four fifteen-ton converters. Messrs. Thomas & Gilchrist, the well-known inventors of the basic system of dephosphorizing ores, are members of this firm, which includes many of the leading metallurgists in Cleveland. The works are specifically designed for the manufacture of steel from Cleveland ore. The phosphorus contained in the iron of the first charge of the converter was between 3 and 4 per cent, and careful analyses of the newly-blown steel resulted in the discovery of only ·02 per cent, which is about one fourth of the quantity usually contained in steel made from the purest hematites. The machinery in the works is laid out with the view to making rails and billets, as well as slabs, etc., for plates of all descriptions and qualities. The probable output of the works, when in full operation, will be from two to three thousand tons per week.

A terrific explosion occurred on the morning of June 22d at blast-furnace No. 5 in the North Chicago Rolling-Mills. Thirty-five tons of molten iron were scattered in every direction. Two men were horribly burned, and will die. Sixteen men were more or less severely burned, but none, it is believed, seriously.

No. 2 furnace of the Thomas Iron Company, at Hokendauqua, has been blown out and will undergo thorough repairs. Five furnaces are now in blast at Hokendauqua. All of the seven blast-furnaces of the Bethlehem Iron Company, except No. 2, are in full blast, and are worked to their fullest capacity. No. 2, which was blown out for repairs several weeks ago, will, it is thought, be lighted in a few days. One thousand men have struck at the Bethlehem works.

The Lincoln Iron-Works, Lincoln, Mass., manufacturers of stone-mill and quarry machinery, are driven day and night to fill orders, mainly on gang-saws for the marble-producing mills. Orders are nearly filled for thirty gangs of these saws. The company also manufactures a heavy line of wood-working machinery, shafting, pulleys, and gearing. A large business is also done in rubbing-beds for marble mills, which is one of its principal specialties.

Twenty-five of the thirty-five blast-furnaces in the Mahoning and Shenango valleys, Ohio, are in operation, producing 2000 tons of metal per day.

A break last week at the bottom of Leesport Furnace, beneath the trough, caused the escape of about thirty tons of iron, which ran into the casting-house, and at one time threatened the destruction of the building by fire. Prompt action of the men, however, prevented any further damage.

During their usual shut-down this summer, the William Anson Wood mower and reaper works, at Youngstown, Ohio, contemplate enlarging their foundry, in order to increase their capacity for production.

The Missouri Malleable Iron Company, which recently increased its capital stock, is making arrangements to more than double its present capacity by building one or two more furnaces, putting in new machinery, and extending its foundry by putting up a new addition. These improvements will be completed some time in July, when the company expects to be able to meet promptly every order for malleables. Its foundry department is full of work.

Swede Furnace, near Bridgeport, Montgomery County, Pa., is to be put in blast again at an early day.

Citico Furnace, Chattanooga, Tenn., is about half finished. The chimney, which is completed, is 170 feet high. The furnace shell will be completed in a few days, and will be 69 feet high and 22 feet in diameter at the bosh. No less than 100 men are working at furnace.

The Laclede Fire-Brick Manufacturing Company is now operating 23 kilns, 5 of which are 24-foot ones. The retort department is crowded beyond precedent, the orders for this kind of goods exceeding by more than one hundred per cent those of any other season. Among the recent orders were one from the Springfield (Ohio) Gas-Works for the building of five benches of sixes, being the second order from that works ; one from the Wheeling Gas-Works for the building of twelve benches ; and another from the Cincinnati Gas-Works for 600,000 fire-brick.

At the Atlas Works, Pittsburg, the first plunger for No. 1 engine at the Negley's Run pumping-works has been cast. Last week, the furnace was charged with 14 tons of metal, but the plunger, when finished, will only weigh eight tons. The Atlas Works have the contract to replace all the defective castings in Nos. 1 and 2 pumps, embracing four plungers, four pump-barrels, four sections of valve-chambers, and two check-valves. When completed, the castings will have an aggregate weight of 275 tons.

MINERAL PATENTS GRANTED BY THE UNITED STATES LAND-OFFICE.

The following patents were issued under date of June 15th, 1883 :

ARIZONA.

TUCSON DISTRICT.

Theodore F. White *et al.*, Silver Cable lode.

CALIFORNIA.

THE BODIE DISTRICT.

Nathan Rhine, Hirsh gold and silver mine.

HUMBOLDT DISTRICT.

Samuel Ambrose *et al.*, placer.

SAN FRANCISCO DISTRICT.

Samuel Baker, coal.

STOCKTON DISTRICT.

Heirs of A. M. Mitchell, deceased, Bonny placer mine. John Batten *et al.*, Bowling Green placer.

COLORADO.

CENTRAL CITY DISTRICT.

Theresa Jaeger, Little Emily lode. George W. Hall, Colorado Extension lode Edmund R. Marsh, O. and M. lode and mill-site. Alexander McLeod, Notaway lode. George A Reuter, Iron lode. J. P. Ward, Stella lode. Hal Sayr, Autocrat and Esperanza lodes. Francis G. Nagle, Gregory lode. Marshel Silverthorn, placer and Willow Creek placer. Julien Fountain, Independence lode.

DEL NORTE DISTRICT.

John R. Burrows *et al.*, Baker lode. William P. Linn, Rawley lode.

DURANGO DISTRICT.

IXL Tunnel Company, Tom Paine lode. Peter Fassbinder, Neptune lode American Midland Mining and Milling Company, Caribbean lode.

LAKE CITY DISTRICT.

Bessie Bascom Consolidated Mining Company, Little Rock and Little Chief lodes. Philip N. Nichols, Rob Roy lode. Oneida & Belcher Consolidated Mining Company, Belcher lode. Hugh J. Alexander, Dictator lode. C. E. Schoellkopf, Revenue lode. M. M. Engleman *et al.*, Lulu Carroll lode. John S. Hough *et al.*, Lilly Lode. Hennan Beckurts *et al.*, Uncle Sam lode. William E. Webb *et al.*, Benjamin Franklin lode.

LEADVILLE DISTRICT.

Roseville-Alta Consolidated Mining Company, Garfield and Roseville lodes. Toronto & New York Consolidated Silver Mining Company, Toronto lode. William J. Lynd, Valverde lode. William Lefman, Ohio Wave lode. Clifton Consolidated Mining Company, Edwin Forrest lode. Henry Frankle *et al.*, Laura Levy lode. G. T. McDonald *et al.*, Jay Gould lode. J. O. Hudnutt *et al.*, Whale and Ned lodes. Lennox Mining and Milling Company, May Day lode. T. J. Oliver *et al.*, Little Dick lode. Thomas R. Frazer, Chance lode. Franklin K. L. Bush, Commodore placer. Americus L. Pogue, Independence placer.

PUEBLO DISTRICT

Bunker Hill Consolidated Mining Company of Colorado, Concord lode. Tellurium Milling and Milling Company, Poor Man lode. Edward Chambers, coal.

IDAHO.

BOISE CITY DISTRICT.

W. S. McCormick *et al.*, Point Lookout lode.

MONTANA.

HELENA DISTRICT.

Lewis Stettheimer *et al.*, Garfield and Silver Crown lode. Charles Schlesinger, Exile of Erin lode. Samuel Neel *et al.*, Pilot lode. Orlando B. Barber *et al.*, placer. Montana Copper Company, Hattie Harvey and Bully Boy lodes. Robert C. Walker *et al.*, placer.

NEVADA.

CARSON CITY DISTRICT.

Ferdinand S. Van Zandt, Lloyd lode.

UTAH.

SALT LAKE CITY DISTRICT.

Samuel Kahn *et al.*, Murphy lode. Phœnix Mining Company, Stanley lode. Carl R. Briggs, coal.

GENERAL MINING NEWS.

ARIZONA.

PECK DISTRICT.

BLACK WARRIOR.—Dispatches from the general manager state that the newly-purchased mill of this company has been started and is making a highly successful run. Two bars of bullion were shipped on the 26th inst.

CALIFORNIA.

MONOCOUNTY—BODIE DISTIRCT.

BODIE CONSOLIDATED.—The official report for the week ended June 16th shows : Ore crushed, 165·6 tons; average assay value of pulp, $33.33 per ton; of tailings, $4.50. West cross-cut, 1000 level, in 26 feet. North drift, same level, in 238 feet. North drift, 800 level, is 591 feet long. South drift from winze No. 6 at the 640 level is 181 feet long. Uprise No. 23 is up 33 feet. Winze No. 5, from the 780 level, is 53 feet deep.

STANDARD CONSOLIDATED.—The superintendent writes to the vice-president, under date of June 12th, as follows : Your letter of the 31st ultimo to William Willis, secretary, is at hand. The increase in our bullion shipments is on account of an improvement in the north stopes on the 500-foot level, and the discovery of some fair milling ore on the 1000-foot level. The south drift No. 2, 1000-foot level, which has been driven from the main east cross-cut a distance of 102 feet, shows the vein from five to seven feet wide. We are stoping from this drift, and although the ore is as yet rather low-grade, this is the most important development made below the 500-foot level, and it gives every indication of making an important ore-body. North drift No. 1, 1000-foot level, 400 feet east of the shaft, is in 164 feet, showing two feet of milling ore. The 1200-foot east cross-cut is in 287 feet, and is pushed ahead as fast as possible. There is no other change to report throughout the mine.

PLUMAS COUNTY—GREENVILLE DISTRICT.

CRESCENT.—On the return of Mr. Davis, work was resumed at the mine and mill

GREEN MOUNTAIN.—The new mill is running steadily as usual. Some very good ore has lately been taken out in the upper levels, the yield of bullion showing a gratifying increase. In the tunnel, the ledge has improved very much in appearance during the past few days.

CANADA.

It may be well, says a correspondent of the Montreal *Gazette*, to remind persons interested in mining in Manitoba and the Northwest territories, for the precious metals and for minerals other than coal, that the regulations in that behalf recently published by the Department of the Interior are not actually in operation, nor is it intended that they shall come into operation at present. It is the purpose of the department, we understand, to place these regulations before the public for some time, so that opportunity may be given for their full discussion and a chance for having them amended if shown to be necessary. It is safe to say that representations on the subject from any quarter would, if submitted to the department in the regular way, receive the most careful and respectful consideration.

MANITOBA.

ARGYLE.—The mine is worked steadily. The recent clean-up gave a return of some $25 per ton, with a good deal left in the tailings. Two Frue vanners are now going up to save these tailings.

PINE PORTAGE.—The mill has started up. The ore is said to be refractory, but will concentrate well and give good returns over cost of treatment.

WINNIPEG CONSOLIDATED.—Over eighty feet of drifts have been opened up, which show a body of high-grade ore. The small mill has not been running of late, as the superintendent found he was losing about 60 per cent, and all the work had to be done over again. They have ordered new grinding and amalgamating pans, which are manufactured at Winnipeg with exemplary slowness. With these in, it is expected that 85 or 90 per cent of the value of the ore wil be saved.

NEWFOUNDLAND.

The three most active copper mines are, as reported, the Tilt Cove, Bett's Cove, and Little Bay. Statistics for last year have not yet been received. The first of these mines opened was that of Tilt Cove, and up to the close of 1879, returns showed that the quantity of copper ore exported from this mine was nearly 50,000 tons, valued at $1,572,154. The value of the nickel ore exported from the same mine, at that date, was $32,740. From 1875 to 1879, the quantity of ore exported from Bett's Cove mine was 123,556, valued at $2,982,836. Little Bay mine was opened in August, 1878. At the close of that year, seven cargoes of ore had been shipped, amounting to 10,000 tons. In 1879, 19,2721 tons were sent to England. In 1880, the exportation reached 16,610 tons; and in 1881, 20,640 tons of ore. Last year's returns are not yet at hand; but it is understood that Little Bay mine increases in productiveness, and that the quantity of the ore improves the deeper the workings have gone.

QUEBEC.

Judge Caron, in the Superior Court, June 22d, gave judgment in the long-pending case of the Queen vs. the Delery Gold Mining Company, in favor of the defendant. This case was brought relative to the patent right of the company. The result of this judgment will doubtless cause a boom among the Beauce gold miners, and induce them to extend their operations.

COLORADO.

CLEAR CREEK COUNTY.

CASHIER.—Messrs. Maccie & Co. are working about 200 feet in from the entrance of the fourth adit on this well-known Sherman Mountain mine, on forty-six inches of mineral, which gave a mill-run from sixty-five sacks last week as follows: Total weight, 3723 pounds; running, first-class, 301 ounces per ton; second class, 152 ounces. Net receipts for the lot, after deducting mill charges, $452.31. Several parties of lessees are working in different parts of the mine.

DUMONT.—The lessees have struck six feet of good milling ore and twenty inches of solid smelting ore in the lower level on the Albro mine. This level starts in on the vein where it crosses the gulch, and is the deepest working on the whole lode. The Lee lode is worked by a shaft which is 86 feet deep, and shows a continuous streak of ore 16 inches thick. The Lincoln cross-cut tunnel, near town, has at last struck the California lode at a distance of 600 feet, having been obliged to run nearly 100 feet farther than was originally expected.

CUSTER COUNTY.

BULL-DOMINGO CONSOLIDATED.—This company has reorganized, and is hereafter to be known as the Bull-Domingo Mining Company. It has a capital stock of $200,000, divided into 200,000 shares of $1 each, unassessable.

DOLORES COUNTY.

SOUTH PARK.—This mine was located in 1879 by Houton, Costello, and Pulver, and was bonded some months ago by Colonel C. A. Jockmus and Hon. E. Pisko, of Denver, and W. J. Cox, of Rico. About 200 feet of tunnel had been run at the time the property was bonded. At the end of a 300-foot tunnel, ore was found in small quantities, and by further exploration the quantity increased rapidly. Top, bottom, and sides of several drifts, radiating from a common point at the extremity, disclose one deposit of manganese ore which mill-runs 334 ounces in silver per ton. Day and night shifts are now at work. A large ore-house is building at the entrance to the tunnel, and a wagon-road is under construction, to be completed in four days. The distance from Rico to this mine is about a half-mile, and the same distance from the mine to the Grand View smelter, where the ore is now shipped. Blasting is not even necessary, as the ore is so soft.

PUZZLE EXTENSION.—This mine has been producing ore in considerable quantities for a long time, and the Santa Clara mill has been treating it constantly. The mine is owned largely by the stockholders of the Santa Clara mill, who have profited largely by the purchase.

FREMONT COUNTY.

CANON CITY OIL COMPANY.—This company has located its well on Mr. Stump's farm, on Oil Creek, four miles northeasterly from town. This is the third working company now operating in this oil basin.

COAL, OIL, AND INVESTMENT COMPANY.—At about 200 feet below the first oil, and at a depth of 1435 feet, this company struck another vein of oil that is of lighter specific gravity, and which seems to be present in good quantities. It will now stop boring and put in the pumping machinery.

LAKE COUNTY.

Late Leadville exchanges contain the following:

The *Herald*, in its description of Colorado Gulch and Little Frying Pan Mining districts, located six miles west of Leadville, says that this section embraces the Sugar Loaf and surrounding mountains, forming a portion of the group of foot-hills situated at the base of Mount Massive. The districts show but one species of rock, and that is a coarse-grained granite, the Archæan rock underlying the Leadville sedimentary formations. As a consequence, an entirely different vein system from that to the east of Leadville is found in this district, and instead of nearly horizontal contact-veins, the country discloses veins which to all appearance are true fissures. The veins show few characteristics not met with in any mineral country under similar physical conditions. The greater number of the leads have a course nearly north and south, being parallel with the axis of the main range of mountains, and their dip is quite uniformly to the westward. The width of the veins varies, extending from two to twelve feet; sometimes presenting well-defined walls, and again the vein-matter and country-rock is imperceptibly blended, so that a trained eye can scarcely distinguish any line of demarkation. The vein-stone is a fine-looking quartz and decomposed gouge matter, carrying the base and precious metals as sulphides. Occasionally native silver is also disclosed, but this feature is rather the exception than the rule. The base minerals associated with the ores are iron, copper, lead, and zinc, usually as sulphides. The most prominent mines of the Colorado Gulch and Little Frying Pan districts are the following: Dinero, Gunnison, Consolidated Virginia, Laplander, Birdie R., Shields, Venture, and Welsh, having in the aggreate an estimated output of twenty or thirty tons a day, when all are working under favorable conditions. At present, considerable difficulty and delay are occasioned by surface water, which will be obviated in a short time when the sides of the mountains have been cleared of their winter's accumulation of snow. At present, while water is plenty, the product of the melting snows, the Frying Pan placer is actively and successfully worked. The gulching season here never exceeds two months, and during many years there is scarcely sufficient water for four or five weeks' work. This year, Mr. William Emery, the owner of the placer, begun work June 4th, since which time he has washed out quite a pit of fairly good pay-dirt, and is now preparing to make a clean-up. Last year, work was done equal to one hundred days, and the final clean-up yielded, for the season, $675. The results for this year are expected to be about the same. The ten-stamp chloridizing and amalgamating mill of the Shields Mining and Milling Company, located at the junction of Colorado and Little Frying Pan gulches, has been closed down since April 20th, but will start up again next week, having been assured ample ore from the large producers of the section.

AMIE.—The company in January, 1881, adopted a system of leasing out portions of its mining ground, which has since been pursued. In December, 1882, a fine ore-body was discovered from the No. 3 shaft workings, which in a few months yielded about $130,000, the company getting about 30 per cent royalty therefrom. There are now five leases on the property, from all of which the company is deriving a small royalty. The company is also itself working the No. 3 shaft. The workings of the northern part of the mine are said to be looking well and improving. In this portion of the mine, there yet remains a large territory of unexplored ground.

CLIMAX.—Little work has been done by this company during the past two years, and owing to the increase of its debt it was recently proposed to dissolve the company and settle up its affairs. All the property is now under lease, and work is done under five leases. Of these only one—covering No. 1 shaft—is now paying. It is stated that the company has, from royalties received, been able to pay its indebtedness, and now has a fair prospect of success. The Climax mine proper has but small territory, the claim for the greater part of its length being but forty feet wide. The claim widens toward the north and in the portion which is now showing the best. Much confusion has been occasioned regarding the Climax by the fact that the original Climax claim conflicted with other locations, the "Climax Contract," the "Montana," and the "Deer Lodge," embracing a portion of the original full claim as located. The Climax Contract and Montana have recently produced largely, and hence the impression has spread that the Climax itself had been producing a large quantity of ore. It is reported that there are strong indications that the north ore-chute of Fryer Hill, which yielded so largely in the Montana, also extends across the Climax. The lessees of the No. 1 shaft are making substantial improvements. Their drifts north extend into entirely unexplored ground. The Climax is under the same management as the Amie, and expenses are said to be kept very low.

COMIQUE.—In this mine, situated on the north side of Fryer Hill, and abandoned for several years past, a body of iron ore has been opened.

IRON SILVER.—The following statement shows the condition of this company June 16th:

Balance May 1st, 1883	$206,445.46
Product for May	127,108.64
	333,554.10
Expenses May month	82,741.19
Balance May 31st, 1883	250,812.91
Net product to June 15th, estimated	22,183.71
	272,996.62
Dividend June 16th, 1883	100,000.00
Balance in bank to date	$172,996.62

LONG & DERBY.—Work has started on this property, which has been idle for a year.

NELLIE S.—A strike of ore containing gold has been made in this mine, situated in Printer-Boy Hill.

TENDERFOOT.—This mine has been leased to Messrs. Slater & Leonard.

LARIMER COUNTY.

CARBONATE.—Work will soon be commenced. The tunnel is in 600 feet.

NORTH PARK & VANDALIA MINING AND SMELTING COMPANY.—This company will probably put up reduction-works this summer. It owns the Endomile, and has a large amoun of ore on the dump.

RARUS & MAUD S. MINING COMPANY.—The directors of this company, organized some time since, have decided to push developments on their properties at once. They are now working a force of men, and the mines show up a fine body of mineral, which improves greatly with the development.

WOLVERINE.—This company has ordered a smelter, which will be put up some time this summer. The superintendent of the mine expects to increase his force of men on this mine soon to 150 men.

PITKIN COUNTY.

MANVILLE SMELTING COMPANY.—The parties who have for some time past been negotiating for the North Texas smelter have secured the same, and have organized a company under the above name. Preparations are making to blow in the smelter at once.

DAKOTA.

Ground has been broken for the railroad to connect the Portland and Trojan groups with the projected new mill on Spearfish, five miles distant. Work will be prosecuted as rapidly as possible.

ESTRELLA DEL NORTE.—The damage made by the recent floods does not amount to more than $1200. No serious delay in operation has been caused.

FAIRVIEW.—An interest in this mine has been disposed of to parties who will at once erect a mill on the property for the reduction of ores. This mine is one of the most extensively developed of the Central Hills.

FATHER DE SMET.—Report of superintendent from June 1st to 8th shows ore extracted from first, second, and third levels 1950 tons. Ore milled, 1950 tons. Golden Gate north header advanced 6 feet. Header in 131 feet. Report from June 7th to 15th shows ore extracted from first, second, and third levels, 2150 tons. Ore milled, 2150 tons. Golden Gate north header advanced 8 feet. Header in 139 feet. All development-work stopped; cause, scarcity of fuse.

GOLDEN SUMMIT.—A force of ten men is now at work at the mine. The main shaft is down 30 feet, and the breast 200 feet in extent. The mill is not in operation, owing to the bad condition of roads and absence of bridges. Every bridge has been washed away from Spring Creek.

GEORGIA.

CALHOUN.—Work is pushed on the flume-line, which is undergoing change to admit of beginning operations at a more favorable point. In consequence of this change of base, the forty-stamp mill is now idle. The new pump has arrived and will soon be in position.

CHICAGO & GEORGIA.—The twenty-stamp mill is now going up.

FINDLEY.—The true reason for the stoppage of work at this mine is said to be a reluctance on the part of a portion of the stockholders to bear their pro rata of the expense of doing certain dead-work which is considered necessary before the mine can again be made to pay.

GARNET.—Work at the mill will begin shortly.

IVEY.—The sixty-stamp mill is completed, and only awaits the completion of

the flume-line and tubing to start up. A force is at work piping the cut, and as soon as this is brought to grade, the new flume will be constructed. The twenty-stamp mill is working on ore from the cut. The ditch is delivering about 200 inches of water, and increasing daily.

SINGLETON.—Work is pushed vigorously in all departments. The new twenty-stamp mill is running on full-time, as is also the old five-stamp mill near by. For some weeks past, a small force has been employed in driving a tunnel from the branch, to tap the vein at the lowest available point, and a few days since a vein, now believed to be the same, was cut. A mill-run of a few tons, just finished, gives very satisfactory results. An average sample from across the vein, including slates as well as the quartz, yielded by assay $3.97 per ton.

MEXICO.

A party of capitalists has examined the copper mines at Nocasari, Sonora. The final arrangements for the purchase of the property have been made, and the price agreed upon is stated to be $350,000. Mr. Lird, of the firm of Motler & Lird, San Francisco, who went with the party, is making estimates for the erection of two thirty-ton smelters at the mine.

A rich placer field is reported 90 miles east of the city of Chihuahua, comprising 3000 acres, with an average depth of 75 feet. The ores run low in silver, high in lead, but are in immense deposits. The property was recently sold to G. M. Shaw, of Socorro, New Mexico, who will work it on a large scale.

ENCINO.—Work at this mine, situated in Pachuca, has been stopped on account of the non-completion of the reduction-works now building by the company. When completed, mining will immediately begin.

SANTA EDUWIGES.—A large invoice of machinery for working this mine, situated in Chihuahua, has reached its destination. This mine is located in the famous Jesus Maria District, and has been worked with profit for over a century. The ore carries both gold and silver and runs three hundred ounces to the ton.

SANTA EULALIE.—The work on the buildings, mill, etc., of this company is progressing with great rapidity.

MICHIGAN.

The Marquette *Mining Journal* gives the following table, which exhibits, in gross tons, the total lake shipments of iron ore from upper peninsula ports the present season, up to and including June 20th, together with the amount shipped from the same ports during the corresponding period of last year:

Name of port.	1882.	1883.
Escanaba	525,748	306,029
Marquette	292,027	100,636
L'Anse	13,308	9,602
St. Ignace	7,499	.....
Total	838,582	416,268

DETROIT.—This mine, says the Marquette *Mining Journal*, is coming to the front rapidly as a steady and profitable producer. With wholly inadequate machinery, they are now raising between 60 and 70 tons a day, which product will be increased to at least 100 tons the coming week—just as soon as sufficient room is made at the bottom of the shaft for an increased force of miners. West of the most westerly pit, a shaft is going down in ore of very fine quality.

NONESUCH.—The managers have been engaged for some time in what turns out to be an impracticable metallurgical treatment of the peculiar deposit-matter afforded by the mine. The attempt to recover the copper in the rock by reducing it by means of rollers and then subjecting it to lixiviation and precipitation has been abandoned, and if mining operations are continued, the usual method of crushing and dressing in the district will be adopted.

PHŒNIX.—The largest creditors of this mining company, says the Houghton *Mining Gazette*, reside in the district and offer to work the mine for the purpose of paying off the local debts of the corporation, which chiefly consist of labor liens.

QUINCY.—The stamp-mill, after a thorough overhauling, has started up again. The mill was out of service about three weeks.

ROPES.—The first stamp-mill for gold mine use ever shipped to Lake Superior has arrived, and been hauled to this mine, three miles north of Ishpeming, where the building that is to hold it is all completed.

MISSOURI.

The people of Bates County, especially in the neighborhood of Rich Hill, are in a fever of excitement over the discovery of oil. It had been generally known that Beaumont & Foote have been sinking a well for oil; and about three weeks ago, there was a rumor that oil had been struck, but the rumor was then hushed up. Later reports stated that a public test of the well would be made June 26th, at three o'clock P.M. At that hour, there were fully three hundred persons on the grounds. The engine was started, and five barrels of the crude oil were drawn up. The well was sunk 600 feet, and the oil has risen 400 feet, and is pronounced by experts to be crude oil in its purest state. A company has been organized, and other wells will be sunk immediately. Great excitement prevails, and property is rapidly advancing in value. All the adjacent land had been quietly leased for a period of twenty years before the announcement was made that oil had been struck.

MONTANA.

DEER LODGE COUNTY.

The Philipsburg Mining District, in which little work has been done for some years, and in which little deep development has been going on lately, has entered upon a new lease of active life and is having a genuine boom. This fact is owing in a great degree to the recent developments on the Granite Mountain in tunnel No. 2. The tunnel has a total length of a little more than 1000 feet. The pay-ore was first encountered at a distance from the face of about 900 feet, from which point the ore has preserved a uniform width of three feet, increasing in many places to five for a length of 130 feet. Within a few days, 500 tons of $500 ore will be shipped to Cheltonham, near St. Louis, for reduction in the Harrison works.

LEWIS & CLARKE COUNTY.

One of the notable events of the coming Fourth of July will be the departure from Helena of a special train by the Northern Pacific, freighted with 1,000,000 pounds of Gregory and Wickes bullion, to Newark, N. J., arrangements to this effect having been consummated. The greater portion of this bullion is now stacked up at the depot. The Wickes works, which will soon start up again with increased capacity for the treatment of ores, will yield fully as much, and when the mines of Ten Mile, Red Mountain, and other neighboring districts are opened up, the Northern Pacific will find large business in the carrying trade of bullion.

NEVADA.

Late mail advices report as follows:

EUREKA CONSOLIDATED.—Affairs in the mine and shaft as usual. Our furnaces running, and producing as heretofore. Shut down No. 3 furnace on the 13th for repairs. Following is the prospect-work done during the week: Third level, uprise in quartzite, 20 feet; in all, 20 feet; Locan shaft, sunk this week, 15 feet; in all, 1194 feet.

HALE & NORCROSS.—The prospect is favorable, but in the hasty development the managers overlooked proper ventilation, the lack of which now delays work.

SUTRO TUNNEL.—The report for the week ended June 15th is as follows: Main tunnel and sub-drain between 18,724 and north lateral. Since last report, the miners employed on the drain have excavated 75 feet and cleared out and enlarged 165 feet more, and placed most of the boxes in position below the level of the track. Flow of water equal to 7,951,500 gallons per 24 hours. The following temperatures were taken: Tunnel entrance, air, 76 degrees; water, 114; shaft No. 1 east, 85; No. 1 west, 88; No. 2 east, 89; No. 2 west, 55; No. 3, 88; No. 4, 91; Combination shaft connection, 83; Osbiston shaft connection, 100; C. & C. shaft connection, 80.

UNION CONSOLIDATED.—It is the general belief that the Union Consolidated cross-cut at the 3000 level will prove a failure, although on the 2900 level feet of ore lay near the west walk.

NEW MEXICO.

The Atchinson, Topeka & Santa Fé Railroad has decided to build a branch from Socorro to the Magdalena Mountains, thirty miles west. One hundred workmen have begun work on the grade. Seventy-five men have begun work on Billings's smelter, which is to be one of two stacks with a capacity of 100 tons.

Silver City is the direct center of a large and important mining district which is located upon the surrounding hills. This includes the celebrated Bremen or 76 mine, 1½ miles distant, which has produced in the last few years nearly $2,000,000. The Sherman mine, one half-mile from Silver City, is also worked, and has furnished mill-runs of $250 per ton. Other mines are Two Ikes, Texas, Legal Tender, No Issue, Old Timer, and others. Just below the city are three stamp-mills, and a concentrator and a smelter are soon to be erected. The center of a large and prosperous mining district, of a great live stock and agricultural region, Silver City is also the county-seat of Grant County, the center of from thirty to forty mining districts, and the metropolis of the new Southwest. The most important mining districts tributary to Silver City and their distances from it are as follows: Silver Flat, one mile southwest; Chloride Flat, two miles west; and Pinos Altos, seven miles north.

NORTH CAROLINA.

Much attention is now directed to gold mines in this State, and an exhibition of the metal is to be made at Boston next autumn. Northern men are pouring into the State prospecting, and there are rumors of large finds. Large quantities of machinery, stamp-mills, etc., are arriving.

A recent report states that a company has been incorporated at Charlotte, with a capital of $2,000,000, for the purpose of conducting gold mining in the State on an extensive scale. The property of the company embraces twenty-two gold mines, varying in the value of their assays. Heretofore, it has cost about $2 for every dollar's worth of gold mined in North Carolina; but the new company claims to have a new process whereby it will save 95 per cent of the gold, and make it a paying business.

UTAH.

EMMA.—The drift from the 130-foot station is nearing the interception of the bottom of the incline run down from the Bay City tunnel until it was drowned. It is expected to strike it at or a little below the bottom. The drift is in vein matter. It is intended to continue the shaft to a greater depth, and at suitable intervals drift across the vein and then open levels. A level is to be run on the 130-foot. The machinery is said to be competent to do the work and take care of any probable amount of water. While the mine may be a wet one, it is not likely to be very wet, the tunnel catching and draining off all the surface-water.

FRISCO.—It is said there are in this mine two feet of galena ore that will go 110 ounces in silver and forty-five per cent lead. There are eighteen inches to three feet of ore in every place that is worked. Another shipment of ore will be made as soon as the snow gets out of the upper gulch.

FRISCO MINING AND SMELTING COMPANY.—At the Cave mine, the property of this company, a rich vein of three feet of ore has been recently struck, going 300 ounces of silver, 3 ounces of gold, and 25 per cent of lead. The richest ore lies above a vein of native sulphur, in some places two feet thick. The sulphur is mixed with gray carbonate, and is very rich. There are fully 11,000 feet of tunneling and drifting in the mine. The main tunnel is in 1300 feet. The mine is not shipping ore at present. The smelter is lying idle. Twenty men are employed, who are thoroughly prospecting the mine.

HORN-SILVER.—The old stacks have been demolished and the ground and part of the dump has been cleaned up. The result was a few car-loads of good bullion. The 600-level of this mine holds out well, the lowest workings, however, showing a tendency to run in copper.

MAMMOTH.—Much to the regret of all mining interests, says the Salt Lake *Tribune*, this great property at Tintic has finally settled into very bad shape. The projectors of the enterprise seem to have dropped it, for the present at least, and all hands seem determine to have a clean-up in the courts before any more real work is done.

MARDOCK REDUCTION-WORKS.—The Ogden *Pilot* states that these works are to be put in operation at Ogden.

ONTARIO.—Shipments have been resumed since the mill clean-up. The great tunnel from the mill to the mine is making swift progress, and is expected to be completed by September, when the pumping of water will be less troublesome for some time to come. During the spring freshets, the lower levels were in imminent danger of being drowned out.

SILVER REEF.

BARBEE & WALKER.—The mine is worked by Gillespie, Lund & Co., employing sixteen men. The mine has an incline shaft 500 feet deep. They are sinking a winze below the fifth level about thirty-five feet, having five feet of ore. Considerable stoping is doing on the third, fourth, and fifth levels. The ore is looking well, there being about 250 tons on hand. The mill is expected to start soon.

CHRISTY.—The company is working its mines steadily, showing great improvement in the quality of the ores. The five-stamp mill steadily pounds away, averaging about fifty pounds daily.

LEEDS.—At the Leeds mill, J. A. Turrill is working the tailings, and is meeting with success, turning out every six days a bar of bullion valued at $1200.

STORMONT.—The company is milling 1200 tons of ore monthly. It is working 50 men in the Savage, Buckeye, and Last Chance—all being worked through the same vertical shaft, 250 feet deep. The deepest workings are on an incline from the foot of this shaft at a depth of 175 feet; from this point, the fifth level extends north and south. The best body of ore lies at the south end of this level. This is a continuous body of ore that has been followed from the croppings down a distance of 750 feet. The present appearances are, that the quality and quantity of ore is getting better. Sinking is about to be commenced on the sixth level. The ten-stamp mill belonging to the company runs sixteen hours daily, milling sufficient ore to be worked by seven settlers and thirteen pans.

Under date June 18th, Superintendent Allen writes from Silver Reef: In winze 15, we are down 41 feet, and have good ore all the way, with an unusually well-marked hanging wall, a favorable indication for the continuation of ore. Assays from the face yesterday showed 26 inches of $140 rock.

WYOMING.

According to the local papers, the mines in Silver Crown District are now worked with an energy well worthy of Western enterprise. On some of them night and day shifts are employed. The owners have had much to contend with in the past, but their perseverance has even now well-nigh brought them their reward. While the ore in the main is of low grade, there are found rich "pay-streaks," some of which assay very high; and if the anticipations of those interested are realized, it is confidently expected that a smelter will be in operation in the district within the next year.

The new discovery located on the Rabbit Ear range of mountains is situated in Red Cañon, about ninety miles from Laramie, in a country which has never yet been prospected. Numerous assays and tests of the ore have been made, and it runs high in copper, and $16 in gold, and $5 silver. This is from the surface, comparatively; for no considerable depth has been reached. It is the intention to sink about six shafts of forty feet each on the two claims, and, if the mines then warrant it, a smelter will be put in. Six men are at work on the mines.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.	Dividends. Total paid to date.	Dividends. Date and amount per share of last.	Highest and Lowest Prices per Share at which Sales were Made. June 23. H.	June 23. L.	June 25. H.	June 25. L.	June 26. H.	June 26. L.	June 27. H.	June 27. L.	June 28. H.	June 28. L.	June 29. H.	June 29. L.	Sales.	
1	Alice, S. C.	Mont	$10,000,000	400,000	$25	*		$400,000	Dec. 1881	.10					2.50							100	
2	Amie Con., S. L.	Colo.	5,000,000	500,000	10	*		305,000	May 1880	.10			.17		.16				.18		.16		2,700	
3	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl. 1875	$1.00	220,000	Feb. 1883	$2.00													B.
4	Argento, S	Nev.	10,000,000	100,000	100	250,000	Mar 1883	.25	40,000	Feb. 1880	.20		.30				.25	.20					900	
5	Barbee & Walker, S.	Utah	1,000,000	40,000	10	*		60,000	Nov 1880	.10														
6	Bassick, G. S.	Colo.	10,000,000	100,000	10	*		200,000	Jun. 1883	1.00														
7	Belle Isle, S.	Nev.	10,000,000	100,000	100	85,000	May 1883	.20	300,000	Dec. 1879	.25	.54	.51	.50		.50		.55		.60		.55	.54	3,915	
8	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,588,000	Apl 1883	.25	15,397,000	Apl 1876	1.00													
9	Birdseye, G.	Cal.		15,000						Dec. 1882														S.F
10	Black Bear, G.	Cal.	3,000,000	30,000	100	15,000	Sept 1879	.50	895,000	May 1883	.20													
11	Bodie Con., G.	Cal.	10,000,000	100,000	100	175,000	Mch 1883	.50	1,295,000	Nov 1882	.20	.95					1.00		.95		.93		600	S.F.
12	Bonanza Developm't	C & M	3,000,000	300,000	10			135,000	Oct. 1882	.15														
13	Boston & Mont, G.	Mont	2,000,000	200,000	10	*		310,000	Jan. 1883	.05														
14	Breece, S.	Colo.	5,000,000	200,000	25	*		2,000	Feb. 1880	.01														P.
15	Bulwer, G.	Cal	1,000,000	100,000	100	30,000	Dec. 1877	.50	165,000	July 1883	.15	.85	.80				.80	.75					820	
16	California, G. S.	Nev.	54,000,000	540,000	100	854,000	Jun. 1883	.20	31,320,000	Dec. 1879	.50	.25		.27	.25	.27		.18	.17				3,100	B.
17	Calumet & Hecla, C.	Mich	2,500,000	100,000	25				23,350,000	May 1883	5.00													
18	Carbonate Hill, S. L.	Colo.							60,000	July 1883	.05													
19	Caribou Con., S.	Colo.	1,000,000	100,000	10	*		50,000	Mch 1880	.10			.13				.13						1,000	
20	Carolina Queen, C.	N. C.	200,000	100,000	2			8,000	Oct. 1882	.02														
21	Castle Creek, G.	Idah.	100,000	100,000	1			39,000	Jun. 1883	.03														B.
22	Cataipa, S. L.	Colo.	3,000,000	300,000	10	*		240,000	Jun. 1883	.10														
23	Central, C.	Mich	500,000	20,000	25	100,000	Sept 1861	.06	1,670,000	Feb. 1883	3.00													
24	Christy, S.	Utah	6,000,000	60,000	100				90,000	Jan. 1883	.10													B.
25	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*		1,600,000	Dec. 1881	.50			1.15						1.15				300	
26	Con. Gold Mining, G.	Ga.	500,000	100,000	5	*		104,000	Jun. 1883	.04														S.F.
27	Con. Virginia, G. S.	Nev.	54,000,000	540,000	100	897,000	Aug 1882	.30	42,930,000	Aug. 1880	.50	.50				.50							700	
28	Contention, S.	Ariz.	12,500,000	250,000	50				22,461,500	Jun. 1883	.25													
29	Copper Queen, C.	Ariz.	2,500,000	250,000	10	*		975,000	Apl. 1883	.50														S.F.
30	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,673,000	Feb. 1883	.25	11,588,000	Jan. 1875	2.00													
31	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*		4,000,000	Jan. 1883	.10														B.
32	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*		200,000	July 1881	.07½			.20				.20						300	
33	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	200,000	May 1883	1.00	4,767,500	July 1882	.25	4.90				8.00							120	S.F
34	Evening Star, S. L.	Colo.	500,000	50,000	10	*		1,225,000	Oct. 1882	.50														
35	Excelsior, G.	Cal.	10,000,000	100,000	100	300,000	Jan. 1882	1.00	875,000	Oct. 1880	.25													
36	Father de Smet, G.	Dak.	10,000,000	100,000	100				590,000	Apl. 1883	.20													
37	Findley											.08									.10	.08	1,400	
38	Franklin, C.	Mich		54,000		360,000	Jun 1877		243,000															
39	Freeland, S.	Colo.	5,000,000	200,000	25	*		50,000	May 1880	.25														
40	Fresno Enterprise, G	Cal.	5,000,000	100,000	50		Mch 1883	.10	110,000	July 1882	.10													
41	Gem, S.	Colo.	125,000	125,000	1			23,750	May 1883	.02														S.F.
42	Glass-Pendery, S. L	Colo.	5,000,000	250,000	20	*		25,000	May 1881	.10														S F.
43	Glen, S.	Colo.	100,000	100,000	1			7,000	May 1883	.01														
44	Gold Stripe											.09											900	
45	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	3,530,000	Jun. 1883	.50	3,826,000	Oct. 1870	10 00													S.F.
46	Grand Central, S.	Ariz.	1,000,000	100,000	10			625,000	Dec. 1882	.25														
47	Grand Prize, S.	Nev.	10,000,000	100,000	100	470,000	Jun. 1883	.25	450,000	Sept 1880	.25	.90		.28		.25	.12	.16					1,500	
48	Granite, S.	Colo	125,000	125,000	1			6,250	May 1883	.01														
49	Great Eastern, G.	Dak.	3,000,000	300,000	10	*		16,000	July 1880	.01														
50	Great Western, Q.	al.	5,000,000	50,000	100	35,500	Aug 1873	.15	262,500	Oct. 1882	.25													
51	Green Mountain, G.	Cal.	1,250,000	125,000	10	*		212,000	Nov. 1881	.07½														
52	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	4,062,000	Jun. 1883	50	1,598,000	Apl. 1871	5.00													
53	Hall-Anderson, G.	N. S.	150,000	150,000	1			7,000	Jan. 1882	.05														S.F.
54	Hecla Con., S.	Mont	1,500,000	30,000	50			462,500	July 1883	.50														B
55	Henriett, L.	Colo.		270,000				27,000	Feb. 1883	.10														
56	Hibernia, S. L.	Colo.	7,500,000	300,000	25	*		180,000	July 1881	.40									.04				500	
57	Holyoke, G.	Idah.	200,000	200,000	1			32,000	Jun. 1883	.02														
58	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July 1878	1.00	1,162,500	Jun. 1883	.40													
59	Hope, S.	Mont	400,000	8,000	50	*		103,124	July 1883	1.50														
60	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*		2,300,000	May. 1883	.75		6.88	6.63	6.75	6.63	7.00	6.75	7.75	7.25			7.63	7.50	2,360	
61	Hukill, G. S.	Colo	1,000,000	200,000	5	*		210,000	Dec. 1878	.10						.06	.05						1,000	
62	Idaho, G.	Cal.	310,000	3,100	100			3,372,250	Jun. 1881	2.50														
63	Independence, S.	Nev.	1,000,000	100,000	100	245,000	May 1883	.30	225,000	Sept 1879	.25								1.00				100	
64	Indian Queen, S.	Nev.	250,000	125,000	2			368,750	July 1883	.03														B.
65	Inyo, G.	Cal	500,000	100,000	5	*		45,000	Apl. 1882	.05														
66	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*		1,100,000	Jun. 1883	.20		2.95		3.00	2.95	2.95			3.00		2.95		3,300	S.F.
67	Jesuitsita, S.	Mex.	10,000,000	100,000	100			850,000	May. 1883	.50														
68	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov 1881	.30	1,261,000	Jun. 1883	.10													
69	La Plata, S. L.	Colo.	2,000,000	200,000	10	*		610,000	Sept 1882	.30														E.
70	Leadville, S. L.	Colo.	4,000,000	400,000	10	*		200,000	May 1883	.05			.56										100	
71	Leeds, S.	Utah	6,000,000	60,000	100	37,000	July 1882	.50	78,000	Oct. 1878	.15													S.F.
72	Little Chief, S. L.	Colo	10,000,000	200,000	50	*		700,000	Aug. 1880	.50													400	
73	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*		1,050,000	Mch 1880	.50		1.00		1.10	1.05	1.00		1.00		1.00		.99	1,050	
74	Marguerite, G.	Cal.	500,000	25,000	20			18,750	Oct., 1882	.25														S.F.
75	Martin White, S.	Nev.	10,000,000	100,000	100	1,000,000	Jun. 1883	.25	90,000	July 1879	.30													B.
76	Minas Nuevas, S.	Mex.	300,000	100,000	3	*		20,000	July 1882	.10														
77	Morning Star, S. L.	Colo.	1,000,000	100,000	10	*		565,000	Dec. 1882	.25														
78	Napa, Q.	Cal.	700,000	100,000	7			260,000	Jan. 1883	.10														
79	Navajo, G. S.	Nev.	10,000,000	100,000	100	235,000	Mch 1882	.20	225,000	May 1883	.25	2.35		2.45	2.40	3.25		3.00		4.15			1,180	
80	New York Hill, C.	Cal	5,000,000	50,000	100	55,000	Mch 1878	.20	215,000	Aug 1882	.10													
81	New York & Colo., G.	Colo.	1,250,000	50,000	25			25,000	July 1879	.10														
82	Northern Belle, S.	Nev.	5,000,000	50,000	100			2,400,000	Apl. 1883	.50														
83	North Belle Isle, S.	Nev.	10,000,000	100,000	100	95,000	May 1883	.20	310,000	Aug. 1881	.15													
84	Ontario, S. L.	Utah	15,000,000	150,000	100			4,925,000	Jan 1883	.50		26.50		27.00				26.25					400	
85	Ophir, G. S.	Nev.	10,000,000	100,000	100	3,545,000	Apl. 1883	.50	1,595,000	July 1882	1.00							2.75					25	B.
86	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl. 1876	1.60	890,000	July 1883	.50													
87	Oxford, G.	N. S.	100,000	100,000	1	*		20,000	Jun. 1883	.05														
88	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	15,000	May 1883	.15	30,000	Dec. 1882	.05													S.F.
89	Polonia, S.	Colo.	200,000	8,000	25			12,000		1882	1.50													
90	Prussian, S. L.	Colo	1,500,000	150,000	10			132,000	Jan 1883	.10														
91	Quick Silver, pref., Q	Cal.	4,300,000	43,000	100			654,000	July 1882	6.00														P.
92	" com., Q	Cal.	5,700,000	57,000	100			151,000	July 1882	.40														
93	Quincy, C.	Mich	4,000,000	40,000	25	200,000	Dec. 1862	5.00	3,570,000	Feb. 1883	6.00													S.F.
94	Renfrew, G.	N. S.	60,000	30,000	2			4,800	July 1882	.02														
95	Richmond, S. L.	Nev.	1,350,000	54,000	25	*		3,975,087	May 1883	1.25														E.
96	Rising Sun, S.	Dak.	750,000	150,000	5	*		52,000	May 1881	.07½														
97	Robinson Bar, G.	Idah.	190,000	100,000	1	*		9,000	Dec. 1882	.03														
98	Robinson Con, S. L.	Colo.	10,000,000	200,000	50			575,000	Nov 1881	.50		.56	.54	.54		.54	.50	.54	.52	.01	.54	.59	15,200	
99	Robert E Lee, S. L.	Colo.	250,000,000	500,000	500			100,000	Dec. 1882	.10														E.
100	San Francisco, C.	Cal.		50,000				25,000	Jan. 1883	.05														
101	Savage, S.	Nev.	11,200,000	112,000	100	5,484,000	Nov	1882	.50	4,460,000	July 1869	3.00												B.
102	Shoshone, G.	Idah	150,000	150,000	1			7,500	Apl. 1883	.01														
103	Sierra Buttes, G.	Cal.	225,000	22,500	10			1,435,308	Apl. 1883	.25														E.
104	Sierra Grande, S.	N. M.	10,000,000	400,000	25			90,000	Apl. 1883	.25														
105	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	5,250,000	Mch 1883	1.00	102,000	Jan. 1871	1.00	4.00		4.00	3.95	4.40		4.10	3.95		3.50	3.35	93	P.
106	Sta P'mas Eureka, G	Cal.		40,625						Apl. 1882														B.
107	Silver King, S.	Ariz.	1,000,000	100,000	100			1,275,000	Jun. 1883	.25						10.25		10.25			10.25		400	S.F.
108	Silver King, S.	Colo.	1,000,000	50,000	2			50,000	Aug. 1881	.10														
109	Smuggler, S. L.	Colo.	600,000	6,000	10			27,900	Mch 1883	.10														
110	Socorro, C.	N. M.	250,000	2,500	100			4,000	Mch 1882	.00¾														B.
111	Spring Valley, G.	Cal.	2,000,000	200,000	1	*		500	Jan. 1881	.25														
112	Standard, G. S.	Cal.	10,000,000	100,000	100	*		4,175,000	Jun. 1883	.25		6.33		6.75	6.63	7.00		6.75		7.00		7.00	1,005	
113	Stormont, S.	Utah	200,000	20,000	1	*		155,000	Nov 1881	.05		.25	.20							.40			300	
114	St. Joseph, L.	Mont	1,000,000	100,000	10	*		300,000	Dec. 1882	.20														
115	Tip Top, S.	Ariz.	10,000,000	100,000	100	220,000	May 1883	.25	100,000	Nov 1881	.20													
116	Tombstone, C. S.	Ariz	12,500,000	500,000	25	*		1,250,000	Apl. 1882	.10														B.
117	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*		75,000	Jun. 1883	.15														
118	United Gregory, G.	Colo	300,000	300,000	1			38,250	Apl. 1883	.25														
119	United Gold Min. Co.	Colo.							Oct. 1883	.05														E.
120	Virginia, S.	Ariz.	5,000,000	200,000	25	*		140,000	Apl. 1883	.10														B.
121	Yellow Jacket, G. S.	Nev.	12,000,000	12,000	100	5,358,000	Feb. 1882	1.00	2,184,000	Aug. 1871	1.50													
122	Yuba, G.	Cal.	5,000,000	200,000	25			4,000	Sept 1881	1.00														

* Non-assessable. † The Deadwood has previously paid $275,000 in eleven dividends, and the Terra $75,000. ‡ This company, as the Western, up to December 1881, paid $1,475,000. Quotations of these stocks will be found in S. F., San Francisco; B., Boston; and P., Philadelphia, tables. E are British mines. Dividend shares sold, 56,040.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, June 29.

The mining market this week has been in a rather demoralized condition. Business has been very dull, and prices generally have been weak. A few stocks, such as Horn-Silver, Eureka, Navajo, etc., have shown some strength. Eastern Oregon continues to be actively dealt in at strong prices. The dealings in Sonora have not been as large as usual, but the price continues to decline. Robinson has been very actively dealt in at very irregular prices. We give a summary of the market below. The total number of mining shares sold at all the Exchanges aggregates 138,740 shares, as against 169,048 last week.

The Comstock shares have been quiet and weak. California has been weak, owing to an assessment just levied, and has sold from 27@17c., with a small business. Consolidated Virginia was quiet and steady at 50c. Sierra Nevada declined from $4.40@$3.35 @$3.50, under a business of 930 shares. Union Consolidated was quiet and steady, selling at $5. Ophir sold at $2.75. Consolidated Imperial sold to the extent of 500 shares at 7@6c. Sutro Tunnel had

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. Number.	Par Value.	Assessments. Total levied to date.	Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. June 23. H.	L.	June 25. H.	L.	June 26. H.	L.	June 27. H.	L.	June 28. H.	L.	June 29. H.	L.	Sales.	
1	Advance M & M. Co.																						
2	Albion, s. L.	Nevada	$15,000,000	150,000	$100	$547,500	March	1883	.50														S. F.
3	Allouez, C.	Michigan	2,000,000	80,000	25	200,000	January	1883															B.
4	Alpha Con., G. S.	Nevada	3,000,000	30,000	100	420,000	March	1882	.50														S. F.
5	Alta, s.	Nevada	10,080,000	100,800	100	2,112,090	April	1883	.25														S. F.
6	Alta-Montana, G. S. L.	Montana	5,000,000	500,000	10											.02						2,000	
7	American Flag, S.	Colorado	1,250,000	125,000	10	300,000	June	1877	.25														
8	Barcelona, G.	Nevada	5,000,000	200,000	25	*																	
9	Battle Creek																						
10	Bear Creek	California	300,000	300,000	1																		
11	Beauce																						
12	Bechtel Con., G.	California	10,000,000	100,000	100	185,000	January	1883	.10														S. F.
13	Best & Belcher, G. S.	Nevada	10,080,000	100,800	100	1,396,190	May	1883	.50														S. F.
14	Big Pittsburg, S. L.	Colorado	20,000,000	200,000	100	*																	
15	Black Jack, G.	California	250,000	100,000	2½	*																	
16	Bonanza Chief	Montana	1,000,000	1,000,000	1	*																	
17	Bonanza King, G. S.	California	1,000,000	10,000	100	*																	
18	Bondholder	Colorado	500,000	200,000	2½				.25														
19	Boston Con., G.	California	10,000,000	100,000	100	95,000	October	1882															
20	Boulder Con.	Colorado																					
21	Bradshaw, S.	Arizona	2,250,000	225,000	10											.31	.30					3,100	
22	Buckeye	Colorado	2,000,000	400,000	5	*																	
23	" preferred	Colorado																					
24	Bull-Domingo, S. L.	Colorado	10,000,000	200,000	50	*																	
25	Bullion, G. S.	Nevada	10,000,000	100,000	100	3,767,000	May	1883	.20														S. F.
26	Bye and Bye	Arizona	1,000,000	100,000	10	*																	
27	Calaveras, G.	California	500,000	500,000	1	*																	
28	Cal. W'r & M. Co., G.	California																					
29	Caledonia, S. H., G.	Dakota	10,000,000	100,000	100	480,000	August	1882	.15											.85		100	
30	Catskill, S.	Nevada	1,500,000	30,000	5																		
31	Central Arizona, S.	Arizona	10,000,000	100,000	100					.30		.27		.30								400	B.
32	Chapparal	California																					
33	Cherokee, G.	California	1,500,000	150,000	10											.03						200	
34	Chollar, S.	Nevada	11,200,000	112,000	100	521,000	March	1883	.50														S. F.
35	Climax									.09	.08	.09		.08		.09	.08	.11	.10	.13		4,500	
36	Colorado Central, S.	Colorado	3,000,000	300,000	10																		
37	Columbia Con., G. S.	Nevada	5,000,000	100,000	50																		
38	Con. Imperial, G. S.	Nevada	50,000,000	500,000	100	1,450,000	May	1883	.05			.07	.06									100	
39	Con. Pacific, G.	California	6,000,000	60,000	100	156,000	March	1883	.15														
40	Crescent, S. L.	Colorado	3,000,000	300,000	10	*																	B.
41	Crowell, G.	North Car.	500,000	500,000	1																		
42	Dahlonega, G.	Georgia	250,000	250,000	1	*								.03								200	
43	Dardanelles, G.	California	1,000,000	100,000	10																		
44	Decatur									.05		.05				.05				.05	.04	10,400	
45	Dunderberg, S.	Colorado	1,500,000	150,000	10	*																	
46	Durango, G.	Colorado	500,000	500,000	1	*																1,500	
47	Eastern Oregon									.07						.06							
48	Elko Con., S.	Nevada					April	1883	.15	.51	.48	.50	.48	.55	.49	.56	.52	.57	.56	.57	.55	10,900	
49	Empire, S.	Utah	10,000,000	100,000	100					.31	.29	.29	.25	.25	.23	.24	.22	.22	.20	.20		12,900	
50	Enterprise	Colorado																					B.
51	Exchequer	Nevada	10,000,000	100,000	100	650,000	June	1883	.20														
52	Fannie Barret, S.	Colorado																					
53	Globe Copper	Arizona																					
54	Gold Placer, G.	Colorado	5,000,000	200,000	25	*																	
55	Goodshaw, G.	California	10,000,000	100,000	100	210,000	June	1883	.10														
56	Granville, G.	North Car.	300,000	300,000	1	*																1,500	
57	Harlem M. & M. Co., G.	California								.04													
58	Harshaw, S.	Arizona	10,000,000	100,000	100					1.40				1.40		1.40		1.40				1,100	B.
59	Head Center, S.	Arizona	5,000,000	200,000	25	160,000	May	1882	.20														
60	Hortense, S.	Colorado	2,000,000	200,000	10																		
61	Julia, G. S.	Nevada	11,000,000	110,000	100	1,405,000	April	1883	.10														
62	Kossuth, G. S.	Nevada	10,800,000	108,000	100	421,200	August	1877	.15														
63	Lacrosse, G.	Colorado	1,000,000	100,000	10													.10		.08		100	
64	Leviathan, S.	Nevada	10,000,000	100,000	100	380,000	September	1882	.25														
65	Lucerne, S.	Colorado	5,000,000	500,000	10	*																	
66	Mariposa pref., G.	California	5,000,000	50,000	100	1,687,500	December	1881															
67	" common, G.	California	10,000,000	100,000	100	1,975,000	February	1883	.25														
68	May Belle, G.	California	10,000,000	100,000	100	84,000	December	1881	.20														
69	Mayflower, S.	Colorado	10,000,000	100,000	100	*																	
70	Mexican, G. S.	Nevada	10,000,000	100,800	100	2,269,000	February	1883	1.00														S. F.
71	Michoacan Synd.	Mexico																					
72	Miner Boy, G. S. L.	Colorado	5,000,000	500,000	10	*																	
73	Miller	Nevada	5,000,000	200,000	25																		
74	Mono, G.	California	5,000,000	50,000	100	535,000	January	1883	.20														S. F.
75	Moose Silver, S.	Colorado	3,000,000	300,000	10	*																	
76	Moulton, G. S.	Montana	10,000,000	400,000	25	*																	
77	Nevada Syndicate																						
78	North Standard, G.	California	10,000,000	100,000	100	20,000	November	1881	.10	.10												200	
79	North Horn-Sil., S. L.	Utah		400,000																			
80	Noonday	California	600,000	60,000	10	208,000	December	1882	1.00														S. F.
81	Old Dominion, C.	Arizona	3,000,000	300,000	10	*																	
82	Oriental	Nevada	2,000,000	200,000	10																		
83	Oriental & Miller, S.	Nevada	10,000,000	400,000	25							.15		.15								600	
84	Overman, G. S.	Nevada	11,520,000	115,200	100	3,604,700	May	1882	.25														S. F.
85	Parnell																						
86	Potosi	Nevada	10,200,000	112,000	100	556,640	May	1883	.25					.45				.45	.42	.44	.43	2,500	
87	Quartz Creek				100																		S. F.
88	Rappahannock, G.	Virginia		250,000		*				.09						.08				.08	.07	4,300	
89	Red Elephant, S.	Colorado	500,000	500,000	1	*																	
90	Retort M. & M. Co.	Colorado			10																		
91	San Pedro, G. S. L.	New Mex.		400,000																			
92	Silver Cliff, S.	Colorado	5,000,000	200,000	25	*								.16								200	B., P.
93	Silver Islet	Canada	1,000,000	40,000	25																		
94	Sonora Con.	Mexico								.23	.21			.20	.18			.19		.19		11,400	
95	South Bodie, G.	California		100,000		100,000	March	1882	.15														
96	South Bulwer, G.	California	10,000,000	100,000	100	195,000	May	1881	.25														
97	South Hite	California	10,000,000	100,000	100		January	1883	.05														
98	South Pacific	California			5																		
99	State Line, No. 1, S.	Nevada	200,000	200,000	1																		B.
100	" No. 2, S.	Nevada	5,000,000	200,000	25																		
101	" No. 3, S.	Nevada	5,000,000	200,000	25																		
102	" No. 4, S.	Nevada	5,000,000	200,000	25																		
103	" Nos. 1 and 4, S.	Nevada			25																		
104	" Nos. 2 and 3, S.	Nevada																					
105	Sullivan, G. S. L.	Maine	500,000	100,000	5	125,000	December	1882	.25														
106	Sutro Tunnel	Nevada		2,000,000		*				.21	.20	.21	.19			.21	.20	.21	.20	.21		14,900	B.
107	Taylor-Plumas	California			10																		B., P.
108	Tioga, G.	California	10,000,000	100,000	100	285,000	October	1882	.10														
109	Tuscarora, S.	Nevada	10,000,000	100,000	100	110,000	October	1881	.15														
110	Unadilla, S.	Colorado	50,000,000	500,000	100	*																	
111	Union Con., G. S.	Nevada	10,000,000	100,000	100	1,620,000	May	1883	.50									5.00				200	
112	Utah, S.	Nevada	2,000,000	20,000	100	1,400,000	May	1883	1.00														S. F.
113	Vandewater	Nevada	20,000,000	200,000	100	*																	
114	Washington	Arizona	2,000,000	200,000	10																		
115	Whalen Copper	Nevada	2,500,000	100,000	25																		
116	Wide West																						
117	Willshire	California	250,000	50,000	5	*																	

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † Stocks quoted on S. F. San Francisco; B., Boston; P., Philadelphia. Non-Dividend shares sold, 82,700. Total shares sold, 138,740.

an active business at steady prices; it sold from 19@21c.

The Leadville stocks record a moderate business at steady prices. Amie was quiet and a little weak, selling from 18@16c. Chrysolite was steady at $1.15, the sales amounting to 300 shares. Dunkin sold at 20c., and Hibernia at 4c. Iron Silver had a small business at steady prices, selling from $3@2.95. Leadville sold at 56c., with one transaction. Little Chief was quiet and a little weak, selling from 57@53c. Little Pittsburg declined from its strong prices of last week, selling from $1.10@99c., with a fair business. Climax showed a little strength and activity; it sold from 8@13c.

The Bodie stocks were quiet at weak prices. Bodie Consolidated sold from $1@93c. with a small business. Standard was quiet and strong, selling from $6.63@$7. Bulwer has been weak, under moderate transactions, selling from 85@75c. Goodshaw sold at 4c., and North Standard sold at 10c.

The favorites of the Tuscarora stocks were strong, while the low-priced stocks were generally weak. The business done in them was small. Belle Isle had a fair business at irregular prices, selling

from 50@60@54c. Navajo showed considerable strength, selling from $2.35@$4.15, with a small business. Independence was quiet and strong, selling at $1. Grand Prize has levied an assessment of twenty-five cents, and was, in consequence, quite weak, selling from 30@12@16c., with small transactions. Argenta was quiet and weak, declining from 30@20c. Elko Consolidated has been active and weak, selling from 31@20c.

In the miscellaneous list, Alice was quiet and steady at $2.50. Caribou was steady at 13c., the transactions being small. Eureka Consolidated has been very strong, under a small business, selling from $4.90@$8. Horn Silver has gained some strength, under a fair business, and has sold from $6.63 @$7.75@$7.50. Northern Belle was quiet and strong to-day, selling from $6.88@$7. The company has passed its usual monthly dividend. Ontario, with a small business, has been irregular, selling from $26½@$27@$26¼. Robinson Consolidated records an active business at irregular prices; it sold from 50@61@56c., the business aggregating 15,200 shares. Sierra Grande was active and irregular, selling from $1.20@$1.45@$1.25. Silver King had a small business at steady prices, selling at $10.25. Stormont was quiet and strong, selling from 20@40c.

Alta-Montana has been quiet and weak at 2c. Bradshaw sold at 31@30c., with small transactions. Caledonia sold at 85c. Central Arizona was quiet and steady, selling from 27@30c. Decatur had a small business at steady prices, selling at 5@4c. Durango sold at 7@6c., the business being small. Eastern Oregon was active and strong, selling from 48 @57c., the transactions aggregating 10,900 shares. Harlem was quiet and steady at $1.40. Oriental & Miller sold at 15c. with a small business. Rappahannock sold from 9@7c. Sonora Consolidated had an active business at weak prices; it sold from 23@18@ 19c. Parnell is the name of a new stock dealt in for the first time this week; it was quiet and irregular at 45 @42@44c. The property of the company consists of twelve mining claims located on London Mountain, Mosquito District, Park County, Colorado, and is on the same mineral lode as the London Mining Company's property, which has proved quite valuable.

PIPE LINE CERTIFICATES.

The petroleum market opened very dull this week; and up to Thursday, the fluctuations were of a very quiet character, with a tendency to lower prices. On Thursday, there was an active spurt in the market, and the price closed stronger than for some days past. To-day, the price has been strong and the market active.

The news from the oil districts states that on Monday last the new Grandin No. 9 well was yielding 225 barrels a day, the Balltown No. 3 was flowing at the rate of twenty barrels an hour, and the Porcupine No. 6, after being torpedoed, was flowing at the rate of 150 barrels. Thursday, it was reported that the production of the Balltown District for the last twenty-four hours was 2504 barrels from twenty-two producing wells, against 2931 barrels on last Friday. There are six wells drilling and eleven rigs up and building in this district. With no permanent increase reported in the productiveness of the oil regions, the pipe line runs continue to exceed the deliveries, and to June 26th the figures are: Runs, 1,700,847 barrels; average per day, 65,417; deliveries, 1,534,222; average, 50,009; excess runs, 166,625 barrels; average per day, 6408 barrels. To-day's reports state that Balltown No. 7 well is flowing 80 barrels from the top sand; but owing to disputed ownership, it will not be opened at present. It is now stated that the monthly report will be more favorable than was expected, and that it will show a marked decline in developments. There are now only eight wells drilling in and around the Cooper tract, and the production is dropping rapidly.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

		Opening.	Highest.	Lowest.	Closing.	Sales.
June	23	$1.16⅞	$1.16¾	$1.15½	$1.15½	1,438,000
	25	1.15½	1.16¾	1.15½	1.16	1,495,000
	26	1.16⅛	1.16⅜	1.15⅝	1.15⅞	1,142,000
	27	1.15¾	1.16⅛	1.15½	1.15½	786,000
	28	1.15½	1.17⅝	1.15¼	1.17⅝	2,423,000
	29	1.18¾	1.18¾	1.17¼	1.17¾	2,226,000
Total sales						9,510,000

DIVIDENDS.

The Lexington Mining Company, of Montana, has declared a dividend (No. 1) of twenty-five francs per share, payable July 1st, at the office of the Crédit Mobilier, 15 Place Vendôme, Paris, France.

The Oxford Gold Mining Company, of Nova Scotia, has declared a dividend of five per cent on the capital stock, payable June 25th.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF JUNE, AND FROM JANUARY 1ST, 1883.

NAME OF COMPANY.	Location of mines.	Paid during month of June.	Since January 1, 1883.
Atlantic, C	Mich.		$80,000
Bassick, S	Colo.	$100,000	200,000
Black Bear, G	Cal.		6,000
Boston & Montana, G	Mont		10,000
Bulwer Consolidated, G	Cal		20,000
California, G	Colo.		7,500
Calumet & Hecla, C	Mich		1,600,000
Carbonate Hill, S	Colo.	10,000	50,000
Castle Creek, G	Idaho	3,000	18,000
Catalpa, S	Colo.		30,000
Central, C	Mich.		60,000
Christy, S. L	Utah		6,000
Colorado United, S	Colo.		16,750
Contention, S	Ariz.	62,500	375,000
Con. Gold M. Co. of Ga	Ga.	4,000	24,000
Copper Queen, C	Ariz.		250,000
Cosmopolitan	Utah		50,000
Crescent, C	"	50,000	100,000
Deadwood-Terra, G	Dak		20,000
Father de Smet, G	"		60,000
Gem, S	Colo.		7,500
Glen, S	"		3,000
Granite, S	"		3,750
Hecla, S	Mont	15,000	90,000
Henriett, S	Colo		27,000
Holyoke, G	Idaho.	4,000	24,000
Homestake, G	Dak	50,000	300,000
Hope, S. C. L	Mont		12,000
Horn-Silver, S. L	Utah.		600,000
Idaho, G	Cal.	7,750	46,500
Indian Spring Drift	"		1,000
Iron Silver, S. L	Colo.	100,000	200,000
Jocuistita, S	Mexico		100,000
Kentuck, S	Nev.	3,000	18,000
Leadville Consolidated, S	Colo		40,000
Navajo, G. S	Nev		125,000
Northern Belle, S	"		100,000
Ontario, S. L	Utah		75,000
Osceola Consolidated, C	Mich.		50,000
Oxford, G	N. S.	5,000	20,000
Prussian, S. L	Colo		15,000
Quincy, C	Mich		240,000
Richmond, S. L	Nev.		202,500
San Francisco, C	Cal		2,500
Shoshone, G	Idaho.		6,000
Sierra Buttes, G	Cal.		30,625
Sierra Grande, S	New Mex.		400,000
Silver King, S	Ariz	25,000	150,000
Smuggler, S	Colo		9,000
Standard Cons., G	Cal	25,000	150,000
Total Wreck	Ariz.		50,000
True Fissure, G. S. L	Utah.	37,500	75,000
United Gregory, G	Colo.		12,000
		501,750	$5,468,625

G., gold. S., silver. C., copper. L., lead. N., nickel. Q., quicksilver.

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY.	Closing Quotations. June 22.	June 23.	June 25.	June 26.	June 27.	June 28.
Albion						
Alpha	1¾	1¾	1⅞	1⅞	2	2
Alta	.50	.55	.50	.55	.45	.45
Bechtel						
Belcher	1⅛	1⅛	1¼	1⅛	1⅛	1¼
Belle Isle	.45	.45	.45	.45	.55	.50
Best & Belcher	4¼	4⅛	4½	4⅛	4⅛	4
Bodie	1	1	1	1	.90	.90
Bullion						
California	.20	.20	.20	.15	.10	.10
Challar	3⅜	2⅞	3¼	3	2⅞	3
Con. Virginia	.50	.50	.45	.50	.50	.45
Crown Point	1⅜	1¼	1⅜	1½	1¼	1¼
Elko Cons				.25	.25	.25
Eureka Cons	5	6	7½	7¼	6½	5
Exchequer		.25	.30	.20	.20	.20
Gould & Curry	2¾	2⅝	2¾	2¾	2½	2¼
Grand Prize	.25	.20	.05	.10	.10	.10
Hale & Norcross		5⅝	6⅛	6⅛	5⅞	6⅛
Independence	.35		.65	.70	1	.85
Martin White			6⅞	6	5	5
Mexican	2	2¾	3¼	3	2⅞	2⅝
Mono						
Mount Diablo		3	3¼	3⅛	3¼	
Navajo	2¼	2¼	2⅜	3	4⅛	3⅛
Northern Belle	6½	6⅝	6½	6¾	6¾	6⅝
North Belle Isle	.45			.35	.45	
Ophir	2¾	2½	2¾	2¾	2½	2⅛
Overman						
Potosi	1¼	1¼	1⅜	1⅜	1¼	1¼
Savage	2¼	2⅛	2¼	2	1⅞	1⅞
Scorpion						
Sierra Nevada	3⅞	3⅝	4½	3½	3½	3⅜
Silver King		10⅜	10	10		
Tip-Top	.40		.40	.40		
Union Cons	4⅝	4¾	5⅝	4⅝	4⅜	4¼
Wales Cons						
Yellow Jacket	3¼	3¾	4	3⅞	3¾	3⅝

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, June 28.

The market for copper stocks continues to rule extremely dull and inactive, the sales for the week hardly amounting to a respectable day's work in ordinary times. There is no pressure to sell stock, neither are there any orders to buy, and consequently business lags, and brokers' commissions are few and far between. Calumet & Hecla sold at $242, at which price any offered is taken. Quincy declined from $49@$48, while Osceola advanced from $19¼@ $21, but subsequently declined to $20, at which it is freely offered. There were no sales of Franklin, and only 200 shares of Pewabic sold at $3½@$3.⁹⁰⁄₁₀, buyer 60. The latest report from the Pewabic is to the effect that a mass of copper of about twenty-five tons was thrown into the opening last week. At the Quincy, the stamp-mill has resumed operations, and the product for June will be fully up to the average output.

The silver stocks are more active, and at the Mining Exchange, there seems to be a revival of the old-time vigor under the lead of Bowman Silver Mining Company, which is the card now, and which fluctuates enough to satisfy the most ardent speculator. The stock closed last week at 42c., from which it declined to 27c. Subsequently it advanced again to 39c., closing yesterday quite strong at 37@38c. This morning, a flood of stock coming on the market sent the price back again to 27@28c. The desire on the part of the shorts to cover strengthened the market, and it closed quite steady at 31@32c. Massachusetts & New Mexico, which has been dull and inactive at 7c., also felt the influence of the better market, and advanced to 9c., at which price about 20,000 shares were marketed. The prospects of the company are more encouraging, and it is quite reasonable to expect the stock to advance to much higher figures. Catalpa has been fairly active; advancing during the week from 60@67½c., with a decline later to 62½c. Sullivan sold at $1⅛@$2. Silver Islet declined to $3; and San Pedro sold at 40c.

3 P.M.—The market was dull this afternoon. A single share of Calumet & Hecla sold at $240. San Pedro declined to $32½. Franklin, $10 bid. Pewabic, $3¼ bid. Quincy offered at $48. Atlantic offered at $12, no bid. Osceola offered at $20. Huron, $1¼ bid. National, $1⅛ bid. Silver Islet, $3 bid. Sullivan, $1½@$1⅝. San Pedro, 30c. bid. Bonanza, $2⅛@$2¼.

BULLION MARKET.

NEW YORK, Friday Evening, June 29.

The rise in the exchanges in India, which caused the recent advance in silver in London, has been lost within a few days, and the market has receded, as shown by the figures of the annexed table, and may be regarded as in suspense for the present.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
June 23	50¾	110¾	June 27	50¼	110⅜
25	50 11-16	110¾	28	50 7-16	110⅜
26	50 9-16	110½	29	50 7-16	110⅜

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended June 29th, as compiled from various sources, amounted to $138,500, as against $131,000 reported for the previous week. The receipts from January 1st, 1883, to date are $5,830,213.53.

Exports and Imports of Gold and Silver at New York.

Exports.

Week ended June 23d	$351,100
Corresponding week last year	1,447,052
Since January 1st, 1883	6,405,704
Corresponding period last year	34,293,437

Imports.

Week ended June 23d	$104,240
Corresponding week last year	46,764
Since January 1st, 1883	6,892,465
Corresponding period last year	1,915,406

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate for discount, and it remains at 4 per cent. During the week, the bank gained £346,000 bullion, and the proportion of its reserve to its liabilities was raised from 41 to 41 5-16 per cent, against 43 per cent at this date last year. June 28th, the bank made a further gain of £75,000 bullion on balance. The weekly statement of the Bank of France shows losses of 1,154,000 francs gold and 1,144,000 francs silver.

BOSTON MINING STOCKS.

	June 22.		June 23.		June 25.		June 26.		June 27.		June 28.		Sales
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez													
Amie													
Atlantic													
Aztec													
Bodie Con.													
Bonanza D.									2.12½	2.06¼			200
Bowman Sil	.38	.30	.30	.28	.29	.27	.39	.35					8,600
Bruns. Ant.													
Bulwer													
California					.25								200
Cal. & Hec.									242	240	242	240	47
Catalpa	.65	.60	.65				.60		.65	.60	.65	.62½	6,450
Central Ariz													
Climax							.09						2.0
Co. Virginia													
Copper F'lls													
Copperop													
Crescent			.28										100
"Cusl"													
Decatur													
Deer Isle			.05										500
Denver City													
Douglas			1.00				1.00						200
Duncan													
Dunkin													
Empire			.20										100
Eureka Con.													
Franklin	10.25												20
Hancock G.													
Harshaw					.50		.50						350
Huron													
Independ'ce													
Indian Q'n.													
Mammoth	.05						.05						400
Mass. & N.M.	.08	.07	.08		.09		.09						60,515
Milton													
Napa													
National													
North. Belle													
Ontario													
Osceola	21.00	20.00			20.00		20.00				20.00		71
Penn-Breck.													
Pewabic											3.50		200
Pine Tree							.13						1,000
Plymouth													
Quincy			48.63	48 25					48.00		48.00		130
Ridge													
Robinson													
San Pedro									.40		.37½	.32½	600
S'ra Nevada													
S'ra Grande													
Silver Islet	3.50								3.00				110
Silver King													
Simpson Gd													
So. Pacific													
Standard													
Sullivan					2.00	1.88							1,400
Sutro Tun.			.22		.21		.22	.21					1,200
Sycamore					.45	.25							2,900
Twin Lead.	.13	.12	.14	.13	.14		.15	.14					16,300
Vizina													

PHILADELPHIA MINING STOCKS.

	June 22.		June 23.		June 25.		June 26.		June 27.		June 28.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amer. Cons.													
Argent	.20	.18	.23	.20	.22	.20	.22		.23		.23		63,500
Arizona So.					.45				.45				1,000
Battle Mt.													
Buena					.01								100
California													
Calista													
Chrysolite													
Cincinnati	.11	.10			.11	.09	.12	.11	.12				15,715
Comprom'e.	.20		.22								.19	.18	5,000
Contention													
Con. Virg.													
Dauntless													
Del Monte													
Denver City	.15	.14	.14						.15				1,900
Eureka													
Girard							.05						1,700
Governor													
Grand Uni'n			.18				.20	.16	.21	.18	.19	.18	25,400
Green Mt.													
Gunnison	.42½	.40	.40						.42½		.42½	.40	9,300
Homestake													
Horn Silver													
Iowa Gulch	.10		.10		.11	.10	.12	.11	.12		.12	.11	55,500
Iron Silver													
King Bul'on													
Ledger Con.													
Little Dia'd.													
Little Maud													
Little Pitts.													
L'g & D'y H													
Montana													
Mt. Sheridan	.04				.04				.04				8,300
Navajo													
North'n B'l.													
Orion					.04								225
Orion Pref.													
Palmetto E.	.02												5,000
Pembina			14								.15		1,500
Penn-Breck.	.11	.09	.10		.11	.10	.11	.10	.11	.09	.12	.11	26,700
Permanent							.02		.02				4,000
Pizarro													
Pizarro Ex.													
Potosi													
Rara Avis													
Rara Avis E.	.09		.09		.09		.09		.09		.09		8,600
Record													
Rico Pion'r.													
Sierra Apac.	.30		.30		.30		.30						5,200
Sierra Be. la.	.70	.67½	.70	.65	.65		.60				.61		3,600
Sierra G'nde	1.13		1 17½	1.15	1.25	1.20	1.42½	1.25	1.25	1.12½	1.25	1.17½	19,750
Sierra Nev.													
Silver Cord.							1.70						300
Silver King.													
Silv'r Plume	.02		.02				.02						7,000
Sonora Con.													
Standard													
Sultana	.04												1,000
Sutro Tun'l.													
Tombstone	.87½		.90	.87½	.92¼	.90	.95		.02		1.06	.97½	9,300
Victor			.02										5,200
Yale Mt.													

BULLION PRODUCTION FOR 1883.

MINES.	States.	Month of May.	Year from Jan. 1st, 1883.
*Alice, G. S.	Mont		$320,419
*Alta-Montana, G. L. S.	"		§10,625
*Belmont	"		17,775
Bodie, G. S.	Cal	9,248	100,590
Bodie Tunnel, G.	"	6,128	51,447
*Bonanza King, G.	"		199,077
*Boston & Montana, G.	Mont		72,318
*Central Arizona, S.	Ariz		35,845
*Christy, S.	Utah		92,654
*Chrysolite, S. L.	Colo	§45,413	192,971
Cons. Bobtail	Colo		18,723
*Contention, S.	Ariz		383,014
Crescent, G.	Cal		13,000
*Custer, G. S.	Idaho		43,572
*Deadwood-Terra, G.	Dak		120,231
*Derbec Blue Gravel, G. S.	Cal	12,885	44,729
Evening Star, S. L.	Colo		47,061
*Father de Smet, G.	Dak	25,120	153,105
*Frisco M. and S. Co., G. S. L.	Utah		§77,084
Gunnell, S.	Colo	13,772	58,828
*Head Center Cons.	Ariz		6,865
*Head Center and Tranquillity	Ariz		18,486
*Hecla Cons., G. S.	Mont		234,984
*Homestake, G.	Dak		330,060
*Hope, S.	Mont	21,389	41,963
Horn-Silver, S. L.	Utah	228,000	1,283,000
Idaho, G.	Cal		88,642
*Independence, G. S.	Nev		34,722
Iron Silver, S, L.	Colo	127,109	503,831
*Kentuck, G. S.	Nev		8,237
*Lexington, S.	Mont	109,629	530,833
*Little Pittsburg, S. L.	Colo		22,873
*Marguerite, G.	Cal		33,200
*Martin White, G. S.	Nev		136,317
Morning Star, S. D.	Colo		84,428
*Moulton, G. S.	Mont		123,288
Mount Diablo	Nev	52,233	127,311
*Navajo, G. S.	"		281,626
*North Belle Isle	"	45,510	1,953
Northern Belle, S.	"		388,525
*Ontario, S. L.	Utah		807,695
*Oxford, G.	N. S.	6,855	28,179
*Phœnix, G.	S. C.		13,666
*Pinal Cons., S. L.	Ariz	25,540	163,400
*Satemo, G.	N. S.		2,500
*Silver Bow, G. S.	Mont		101,241
Standard, G.	Cal	71,313	442,796
Star, S.	Nev		27,095
*Stormont, S.	Utah	21,377	95,658
Syndicate, G.	Cal	5,987	20,073
Tintic M. and M. Co.	Utah		7,632
*Tip Top, S.	Ariz		‡22,983
*Tombstone, G. S.	"	76,600	‡322,830
Wyoming Cons	Cal		31,541
Yellow Jacket, S.	Nev	30,191	183,064
Total amount of shipments to date			$8,684,864

* Official. † Net value. ‡ Assay value. § Not including value of lead. *G. Gold. S. Silver. L. Lead.*

METALS.

NEW YORK, Friday Evening, June 29.

Copper.—Beyond trifling sales of a jobbing character, there is nothing to report. Lake is nominally 18⅛@18¼c., and other brands 14@14½c. England cables, f. o. b., Chili Bars, £64 10s.; and Best Selected, £70; prices, therefore, being very well maintained there.

Tin.—Business is picking up. There is a good jobbing demand, and the spot stocks are concentrating in a few strong hands. We quote spot Straits and Malacca, 21½c.; Australian, 21⅝@21¾c., with sales at 21⅝c.; Banca, 22c.; and Lamb & Flag, 21¾c.

Lead.—Our market has remained dull and featureless. It seems that manufacturers have pretty well supplied themselves by purchases for future delivery, and the fear is expressed that stocks may accumulate here unduly. The business in Refined lead for the year thus far has been exceptionally light in the East. Spot lead is freely offered at 4·40c.

We note sales of about 500 tons of Common and some Refined, for August delivery, at 4·40c, 4·42½c., and 4·45c.

Messrs. John Wahl & Co., of St. Louis, wire us as follows to-day:

Our market is unchanged. We quote refined 4·13c. Of Hard lead, there have been no sales; it is quoted nominally at 4·12½c. Refined is offered at 4·15c. for July delivery.

Messrs. Everett & Post send us the following dispatch:

There has been considerably more inquiry for both Hard and Soft lead, and though only little business has been done, sellers ask a slight advance. Sales aggregate 650 tons of Common and Refined at 4·15c. and 4·20c. We close nominally 4·17½c. and 4·20c.

Spelter.—The market continues dull, with little business transacting. Quotations are nominally 4·50 @4·60c. for good ordinary Domestic.

Antimony.—The feeling is a trifle better, notably so far as Cookson's is concerned, which we quote 10½ @10⅝c., while Hallett's is less firm at 9½@9⅝c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 29.

American Pig.—The improvement in the standard grades of foundry pig noted in our last has gained in strength, and the best brands of No. 1 are now held at $23@$23.50 for delivery in September and October. We may note, as showing an increasing interest in the Metal Exchange, that there were sold there to-day 800 tons of No. 1 Pig at $23 and $23¼ for September delivery, and $23½ for October delivery. Furnace agents report sales of upward of 8000 tons, the bulk of it Thomas No. 2 and Forge, at $20 and $19. The Thomas Iron Company now declines to sell even to regular customers at former figures, and quotes $20 and $22 now for No. 2 and No. 1 Foundry. The heroic cure, against which there were so many vehement protests, has brought a healthier tone into the market much earlier than it would have been reached by a lingering period of gradual weeding out of the weak elements. Thus far, the improvement is confined to No. 1, which we quote $21@$23 good to choice grades, spot cash at tidewater. No. 2 is worth $18.50@$20 and Gray Forge $18@$19.50. Bessemer Pig is quiet at $21 asked, foreign cables being 50@51s. Spiegeleisen is dull and quiet, with quotations at $31.50@$32 for 20 per cent, $47@$48 for 40 per cent, and $25.50@$26 for 10 to 12 per cent.

Scotch Pig.—Business here has been of a restricted character, though there is a more hopeful feeling, in sympathy with the better tone in the higher grades of American pig. The arrivals continue at the average scale, about 1000 tons per week, while freights are firm at 7s. 6d.

At the Exchange, the following cable quotations were received yesterday: Coltness, 60s.; Langloan, 59s. 6d.; Summerlee, 57s. 3d; Gartsherrie, 57s. 6d.; Glengarnock, at Ardrossan, 54s.; and Eglinton, at Ardrossan, 48s. Warrants to-day were 47s. We quote here, all ex ship, Coltness, $24@$24.50; Langloan $24; Summerlee, $23.50@$24; Gartsherrie, $23.50 @$24; Glengarnock, $22; and Eglinton, $21.

Rails.—During the week, one order has been placed of 10,000 tons at $37.50 at mill, and another order for the same amount is on the market, both we understand, for fall and early winter delivery, for which

$37.50@$38 may be considered the ruling quotation, though some buyers seem unwilling to go so high. For summer delivery, a few small lots may be placed at $38@$38.50 at mill. England cables £4 15s.@ £4 17s. 6d.

Old Rails.—The market is quiet and dull, with bids at $21@$21.50 for Ts.

Scrap.—We have no business of consequence to report, the market remaining dull at $22.50@$23 for No. 1, ex ship.

Philadelphia. June 29.

The situation of the Eastern Pennsylvania iron trade has not improved during the past week, on account of the closing of the season and the indisposition of large buyers to enter into any contracts for summer or fall requirements. There are no special causes depressing the market, but a wholesome conservatism prevails in iron-trade circles, growing out of the happenings of the past sixty days. Things have not gone exactly as was expected. If the necessary restriction of output takes place, those who stay to enjoy the trade will find no trouble in maintaining remunerative rates; but should all conclude to stay and divide the business, there will be a vigorous and unhealthy competition, which will for a while retard demand, rather than stimulate it. The full output in the West is the chief disturbing factor in the iron trade. The manufacturers of specialties there possess some advantages which enable them to crowd down the plain bar manufacturers East on prices. The fraternal feeling generated in consequence of this operation of competitive forces is not overwhelming. Leading manufacturers, in summing up the half-year's work, say that, on the whole, it has been as good as the average of six or seven years past, and that the indications for the midsummer and fall trade are satisfactory to them. There is a fair run of orders. Prices have been well maintained. The demand is widening, and there are no special reasons for anticipating any sudden breaking-up of the favorable conditions surrounding the trade. To what extent restriction may become necessary is a problem which will be determined in a few weeks. Meanwhile, bar mill men will repair, take stock, settle up, and wait to see what will be developed. Unless iron can be made at present cost and sold at present prices, there will be no strong inducement to begin soon. A great deal of Bar iron has been selling within a few days in a small way, at 2·10@2·15c., and only the finest makes command more. The storekeepers report a fair run of retail trade. Country mills are, in some cases, short of orders, and hence the competition referred to. Others have some orders for car iron, which will last them a few weeks. The railroad requirements are a strong support to the trade, and a good deal of iron for such purposes will be needed before winter. Inquiries have been made for 100-ton lots for July and August, but in most instances heard of, nothing was consummated, as manufacturers see no room for further concessions so far ahead.

Pig-Iron.—Brokers are not doing much excepting in No. 1 Foundry. This is scarce, and the special brands seem to be either sold up or virtually contracted for by regular customers. The limit of prices is about $20@$23.50 at shipping port, although in some few cases less and more have been taken. The supply of No. 1 is short in makers' hands, and consumers seem to have permitted stocks to run unnecessarily low, and the makers think they will pay the penalty before the summer is over, as the output is not as great as in cold weather. No. 2 has been the foot-ball of the market for some weeks, and is now developing more strength, reflected on it by the greater firmness of No. 1. Foreign irons are not worthy of a line this week.

Plate and Tank Iron.—The business in sight for July, if secured, will satisfy the successful competitors for a few good lots of iron. As a general thing, plate is bought in small lots, on account of the notion of buyers and contractors that present prices are not the lowest. Tank ranges from 2·30@2·40c.; Shell, 3@3·25c.; Flange, 4@4·10c.

The boat-yards and ship-yards and some locomotive-works have been making inquiry for a good deal of iron to be delivered through the summer.

Structural Shapes.—Quotations are, for Angles, 2·40c.; Beams and Channels, 3·20c., with concessions on heavy orders, which are rare. The situation at the mills is satisfactory, and a busy summer is assured. Inquiries for a few large lots are on the market, but will not be placed until after next week.

Sheet-Iron.—All the sheet-iron manufacturers are busy, and some of them have gathered up enough orders to last them over summer. Consumptive requirements are large enough for the capacity, and hence makers say that prices will remain about where they are. Card rates are 4@4½c., though retail lots command a little more. Large orders are taken at less. Galvanized is 40 per cent off for best, and 35 for next best. Shipments for the last few days have been unusually large.

The hardware trade is doing very little at present outside of the usual season goods, which are in active demand.

The discounts on wrought pipes are 70 per cent, and on tubes, 57½@60, and large manufacturers report business mostly of a retail character.

Old material is without any activity. Steel rails are firm on reported quotations, and, after the turn of the season, manufacturers look for large orders for winter delivery. Cargo Scrap, $23; English Tees, $22, without sale; Double-Heads, $25@$26; Selected Scrap, $24.

Pittsburg. June 28.

The undertone of the Western Pennsylvania iron market is less satisfactory than last week. Leading manufacturers, interviewed with reference to the prospects of the trade, express the opinion that there is very little improvement to be hoped for, as long as the present output is maintained; that the policy of full production is at variance with the interests of the iron trade; and that a reaction will take place, sooner or later. Business is dull in all departments. Current requirements have been restricted, and transactions with reference to future requirements are extremely rare. Something of the nature of a shut-down is believed to be necessary, and this will be inaugurated next week, by the going out for the repairs incident to the season. The local furnaces supply the mill requirements, and stocks are accumulating at the valley furnaces. A further restriction in the output of both furnaces and mills must take place.

Gray Forge Iron, lake ore, $17; Bessemer, $21.50; No. 2 Refined, $18.50; White and Mottled, $16@$17. Muck Bar is extremely dull at nominally $34. Some mills on Merchant Iron have stopped, and some will shut down in a few days. Ordinary quotations are 1·90@2c., but sales have been made as low down as 1·75c. in occasional cases. Shipments of nails have been made from Pittsburg and Wheeling. Stocks are light, and prices firm at $2.90@$3. Steam Pipes are 70 and 10; Boiler Tubes, 55 and 5. Oil-well Casing, 45@50c. per foot. Heavy shipments of Steel Rails are made by river, and new orders are coming in at $38.50. Old Rails are in active request, and are selling freely at $22.50@$25. Scrap is without any activity whatever. The trade is at a standstill, and nothing but a general rest will improve prices.

Cleveland. June 26.

We have nothing special to note for the past week, the situation remaining about the same. While there is no real advance in prices, the tendency is upward. Western furnaces very generally expect to blow out; this would undoubtedly in a measure help Eastern furnaces. There has been more ore sold for the past week than for a corresponding period for some time. We quote:

No. 1 Bessemer	$21.00@$22.00
" 1 Foundry, all ore	20.00@ 21.00
" 1 Foundry, cinder mixture	19.00@ 20.00
" 1 Soft Foundry	20.00@ 21.50
" 1 Open Silvery	19.50@ 20.00
Mill irons	18.00@ 19.00
4 months f. o. b. cars furnaces.	
Nos. 1 and 2 Charcoal	$24.00@$26.00
" 3, 4, 5, and 6 Charcoal	25.00@ 26.50
Hanging Rock Charcoal	23.00@ 25.00
Strictly Cold-Blast Charcoal	25.00@ 30.00
4 months f. o. b. cars Cleveland.	
Bessemer ores	$7.00@$8.00
Hematite ores	5.00@ 6.00

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 29.

Anthracite.

There is some activity shown by commission men and dealers to secure coal at present prices, and some of the companies report heavy sales. In other quarters, the market is quiet. There is little doubt now that the advance noted previously will be asked, but it remains to be seen whether it will be generally secured.

The following figures will be of interest to the trade as showing what wide differences exist among some of the companies in promptly shipping their coal:

Port Richmond, Philadelphia & Reading Railroad.

	Tons.
Shipments to November 30th, 1882	2,017,896
Of which wheeled (41 per cent)	841,805

Perth Amboy, Lehigh Valley Railroad.

	Tons.
Shipments to November 30th, 1882	1,791,755
Of which wheeled (19·57 per cent)	350,631

Port Johnson, Lehigh & Wilkes-Barre Coal Co:

	Tons.
Shipments to November 30th, 1882	1,417,662
Of which wheeled (9 per cent)	129,274

South Amboy, Lehigh Pier, Pennsylvania Railroad.

	Tons.
Shipments to November 30th, 1882	486,614
Of which wheeled (40·3 per cent.)	196,158

South Amboy, Wyoming Pier, Pennsylvania Railroad.

	Tons
Shipments to November 30th, 1882	347,323
Of which wheeled (32·3 per cent.)	112,019

Harbor freights show a tendency to stiffen, while Eastern freights are less strong.

Bituminous.

There is nothing of interest to report. Current business is still remarkably slack, and concessions appear to be freely made.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ended June 23d and year from January 1st:

TONS OF 2240 LBS.	1883. Week.	1883. Year.	1882. Week.	1882. Year.
Wyoming Region.				
D. & H. Canal Co.	99,563	1,702,682	84,172	1,539,120
D. L. & W. RR. Co.	122,428	2,139,497	107,431	2,014,921
Penna. Coal Co.	37,605	600,738	38,378	581,205
L. V. RR. Co.	39,988	505,529	19,290	512,000
P. & N. Y. RR. Co.	4,403	93,805	4,189	95,184
C. RR. of N. J.	56,048	1,147,785	59,396	1,003,045
Penna. Canal Co.	14,521	151,047	15,392	173,287
North & West Br. RR.	7,302	216,355	.....	.....
	381,856	6,557,438	328,248	6,008,762
Lehigh Region.				
L. V. RR. Co.	116,291	2,217,080	117,131	2,171,322
C. RR. of N. J.	62,148	1,059,302	55,340	996,574
S. H. & W. B. RR.	1,783	23,680	.....	20,000
	180,222	3,300,062	172,471	3,187,896
Schuylkill Region.				
P. & R. RR. Co.	181,762	3,138,081	175,939	2,922,568
Shamokin & Lykens Val.	34,874	624,543	29,252	546,017
	216,636	3,762,624	205,191	3,468,585
Sullivan Region.				
St Line&Sul.RR.Co.	1,677	29,117	1,627	27,070
Total	780,391	13,649,241	707,537	12,692,313
Increase	.....	2,956,928	.....	.....
Decrease	.....	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Total same time in	1878	7,212,065 tons.
" " "	1879	12,033,998 "
" " "	1880	10,321,876 "
" " "	1881	12,577,684 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 330,066 tons, as compared with the corresponding period in 1882.

Belvidere-Delaware Railroad Report for the week ended June 23d:

	Week.	Year. 1883.	Year. 1882.
Coal for shipment at Coal Port (Trenton)	4,617	42,860	29,675
Coal for shipment at South Amboy	21,127	390,842	372,999
Coal for distribution	17,392	374,414	332,862
Coal for company's use	2,868	70,400	61,340
Total	45,004	878,516	796,876
Increase	.....	81,640	.....
Decrease	.....	.....	.....

The Transportation of Coke over the Pennsylvania Railroad for the week ended June 23d and year from January 1st:

Tons of 2000 lbs.	Week.	Year.
Penn. RR. (Alleghany Region)	526	49,426
West Penn. RR.	2,003	51,413
Southwest Penn. RR	42,742	968,194
Penn. & Westmoreland Region, Pa. RR	4,066	110,196
Pittsburg, Penn. RR.	31	454
Snow Shoe (Clearfield Region)	489	9,971
Total	49,857	1,189,654

Horsford's Acid Phosphate,
A Reliable Article.

Dr. E. CUTTER, Boston, Mass., says: "I found it to realize the expectations raised, and regard it as a reliable article."